

FIG. 1A

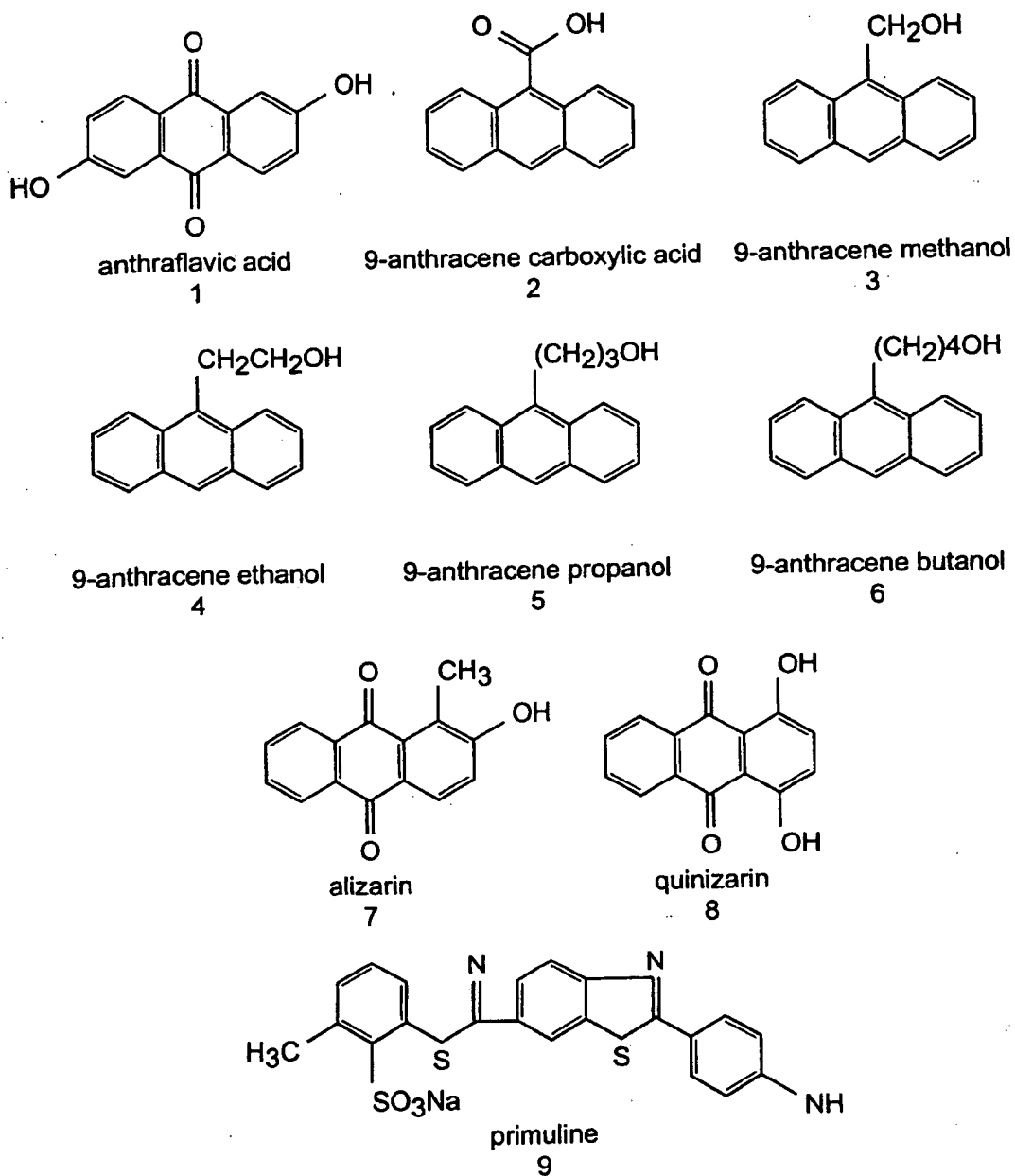


FIG. 1F

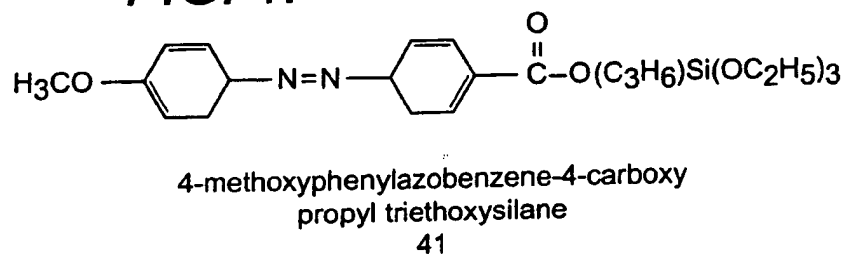
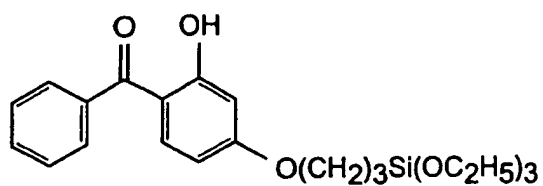
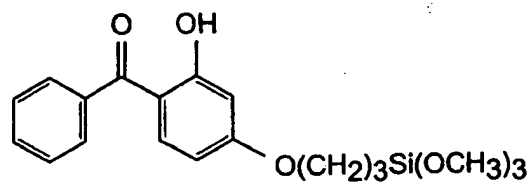


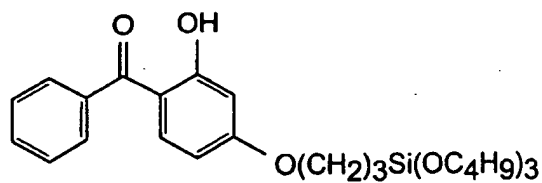
FIG. 1B



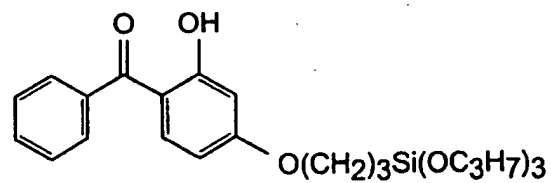
2-hydroxy-4-(3-triethoxysilylpropoxy)-
diphenylketone
10



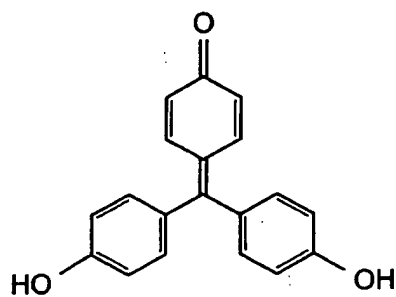
2-hydroxy-4-(3-trimethoxysilylpropoxy)-
diphenylketone
11



2-hydroxy-4-(3-tributoxysilylpropoxy)-
diphenylketone
12



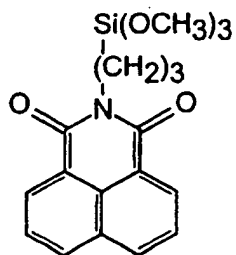
2-hydroxy-4-(3-tripropoxysilylpropoxy)-
diphenylketone
13



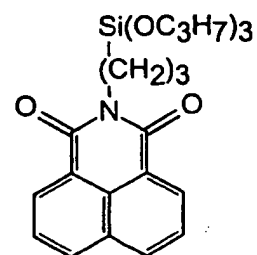
rosolic acid
14



triethoxysilylpropyl-1,8-naphthalimide
15

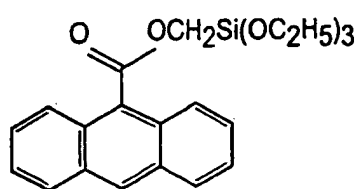


trimethoxysilylpropyl-1,8-naphthalimide
16

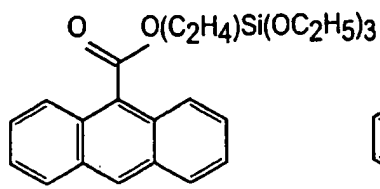


tripropoxysilylpropyl-1,8-naphthalimide
17

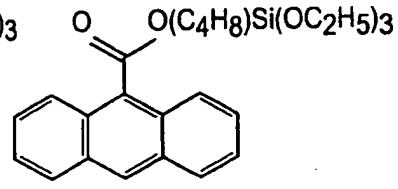
FIG. 1C



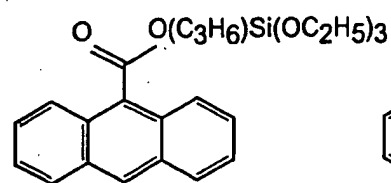
9-anthracene carboxy-methyl
triethoxysilane (TESAC)
18



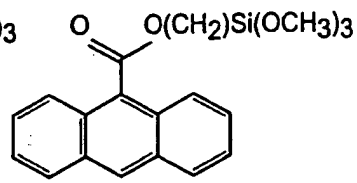
9-anthracene carboxy-ethyl
triethoxysilane
19



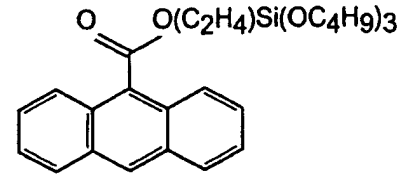
9-anthracene carboxy-butyl
triethoxysilane
20



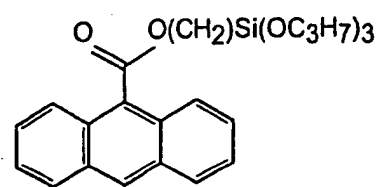
9-anthracene carboxy-propyl
triethoxysilane (TESAC)
21



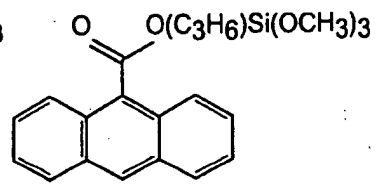
9-anthracene carboxy-methyl
trimethoxysilane
22



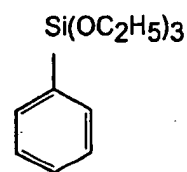
9-anthracene carboxy-ethyl
tributoxysilane
23



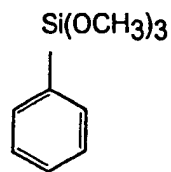
9-anthracene carboxy-methyl
tripropoxysilane
24



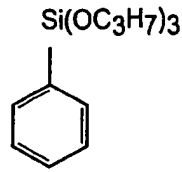
9-anthracene carboxy-methyl
trimethoxysilane
25



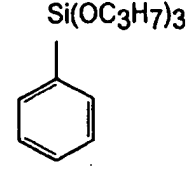
phenyltriethoxysilane
26



phenyltrimethoxysilane
27

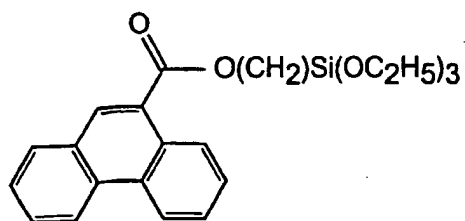


phenyltripropoxysilane
28

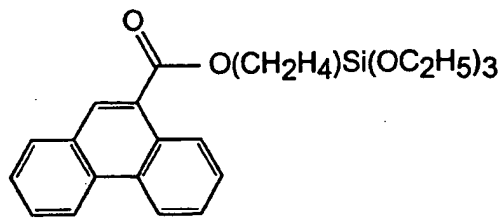


phenyltriethoxysilane
29

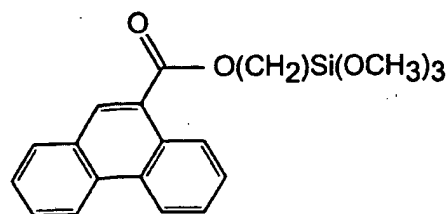
FIG. 1D



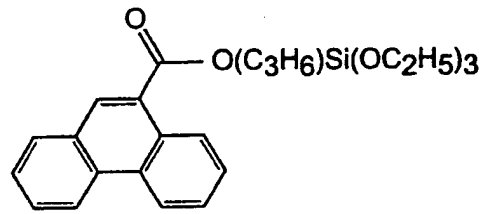
10-phenanthrene carboxy-methyl
triethoxysilane
29



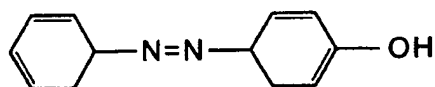
10-phenanthrene carboxy-ethyl
triethoxysilane
30



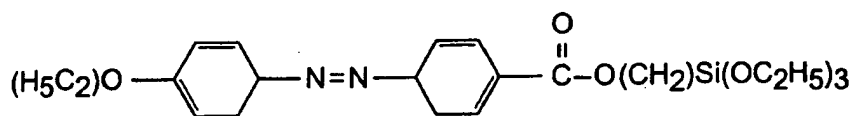
10-phenanthrene carboxy-methyl
trimethoxysilane
31



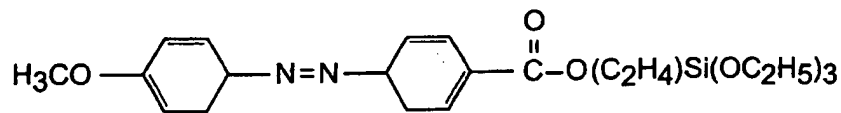
10-phenanthrene carboxy-propyl
triethoxysilane
32



4-phenylazophenol
33



4-ethoxyphenylazobenzene-4-carboxy
methyl triethoxysilane
34

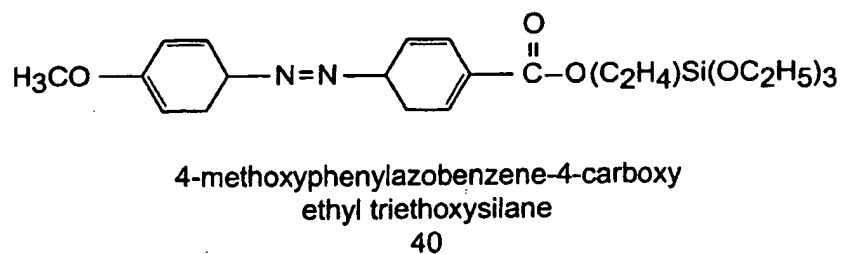
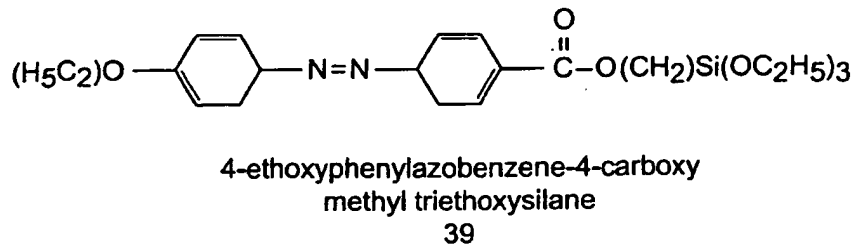
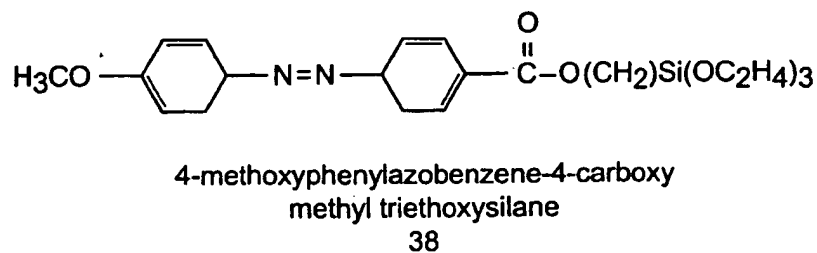
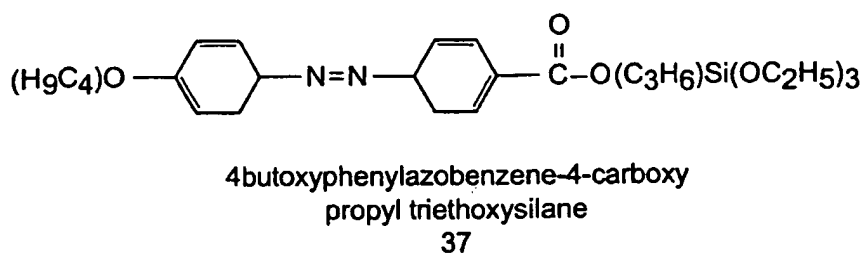


4-methoxyphenylazobenzene-4-carboxy
ethyl triethoxysilane
35

$$\text{(H}_5\text{C}_2\text{)O}-\text{C}_6\text{H}_4-\text{N}=\text{N}-\text{C}_6\text{H}_4-\text{C}(=\text{O})-\text{O}(\text{C}_3\text{H}_7)\text{Si}(\text{OC}_2\text{H}_5)_3$$

4-ethoxyphenylazobenzene-4-carboxy
propyl triethoxysilane

36



TGA

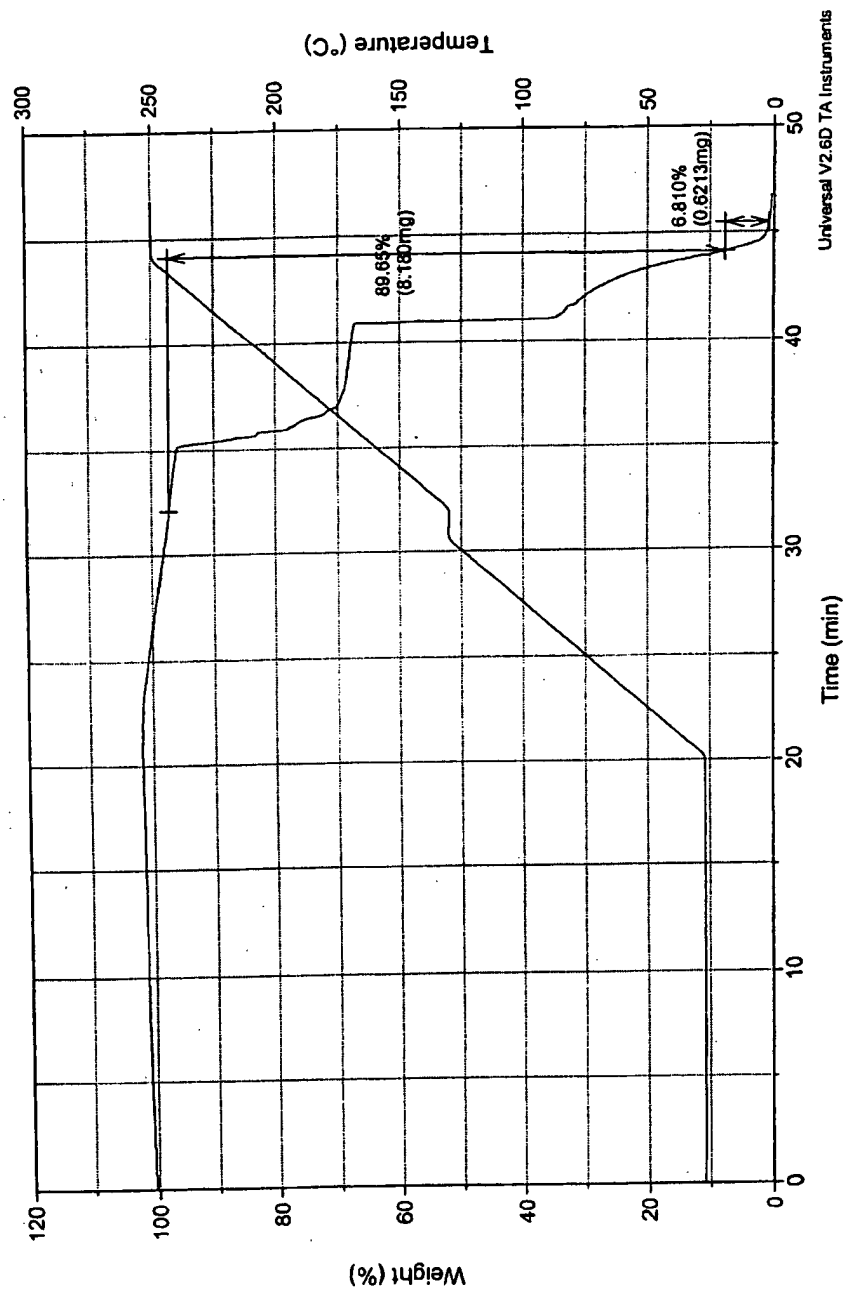


Figure 2

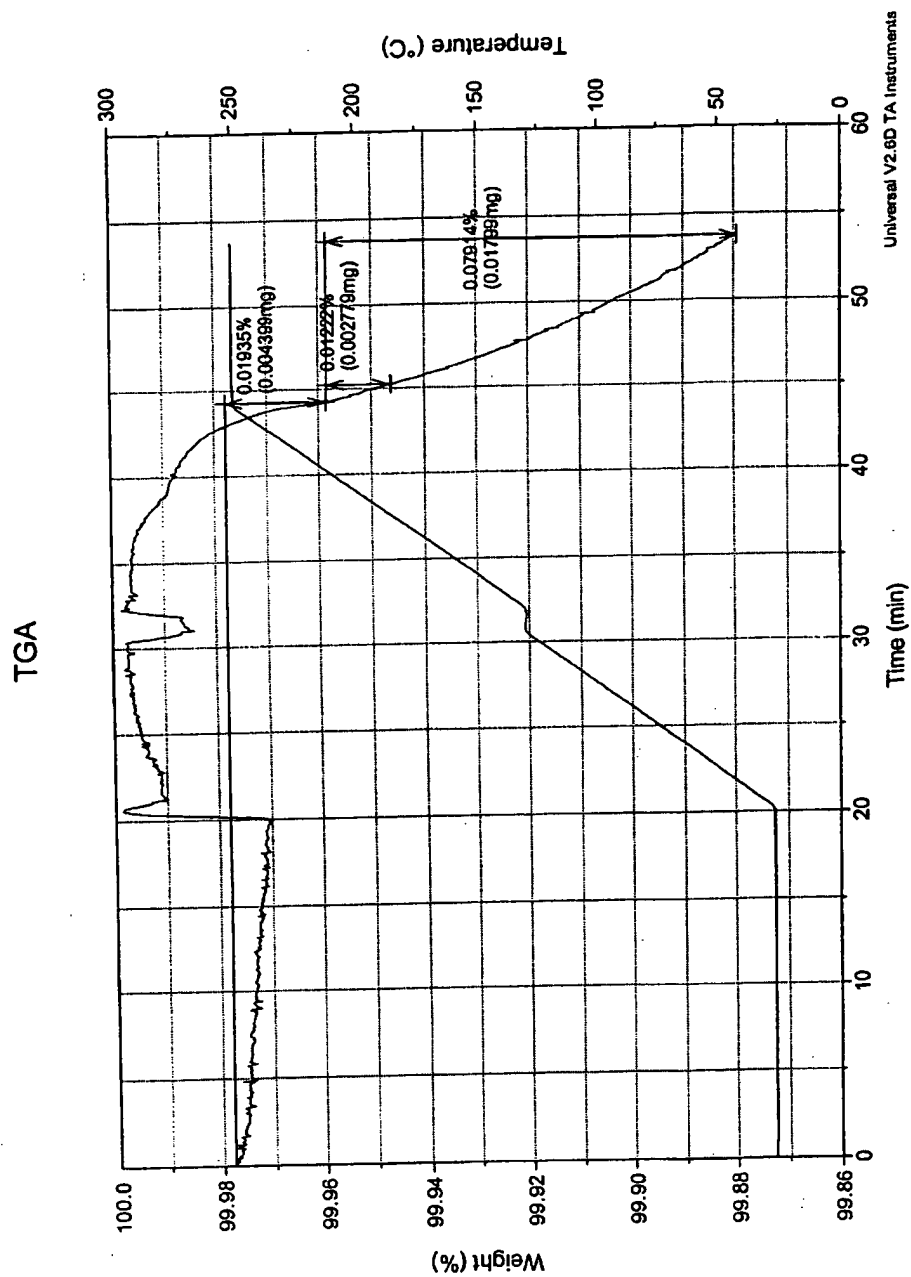


Figure 3

TGA

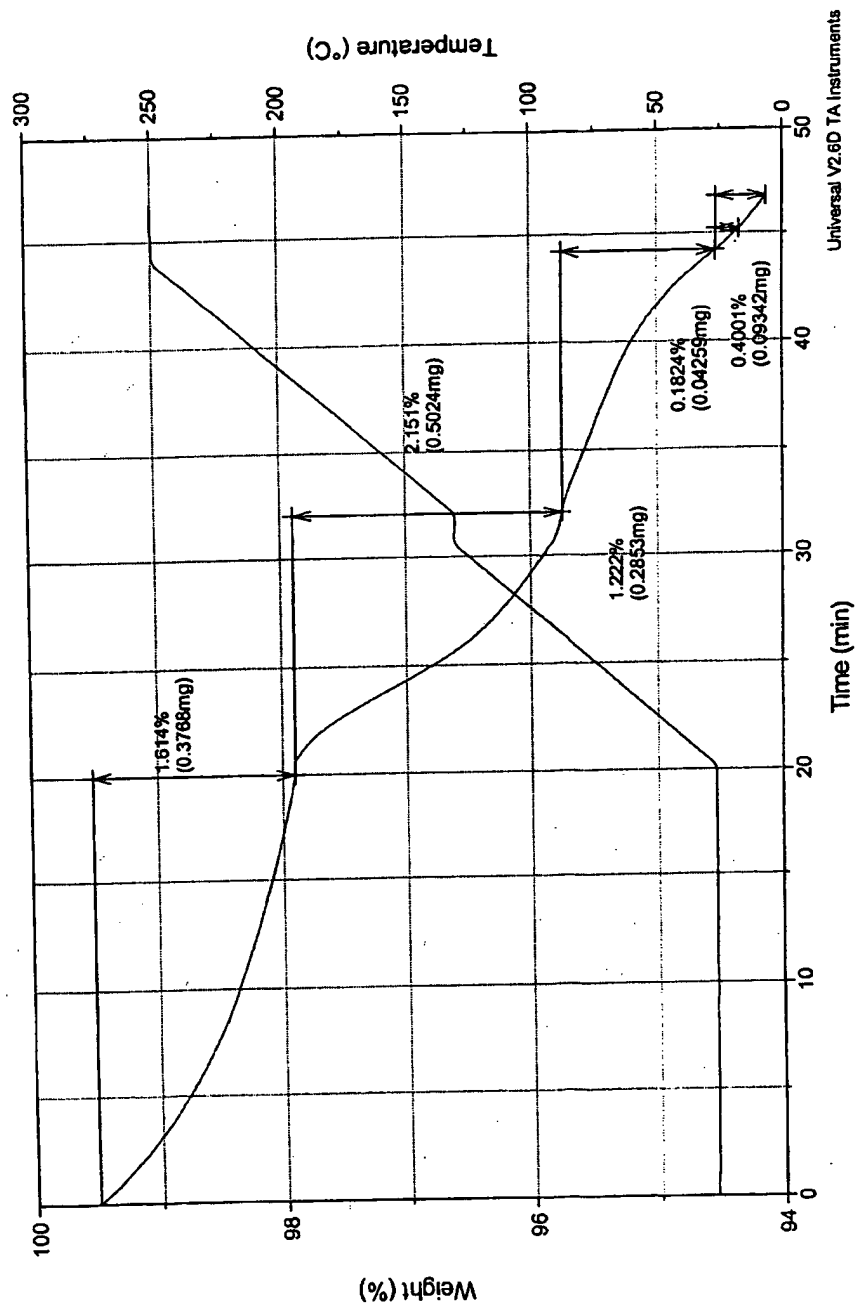


Figure 4

TGA

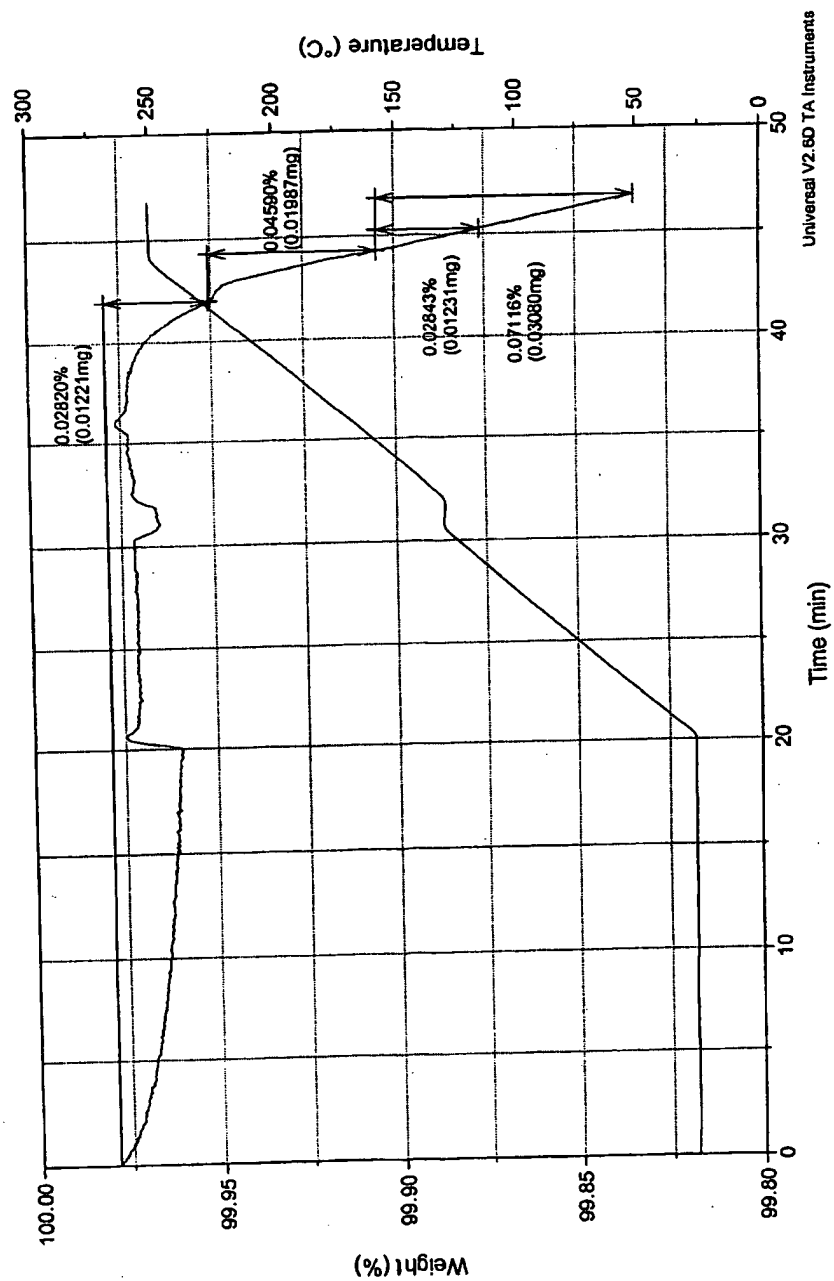


Figure 5

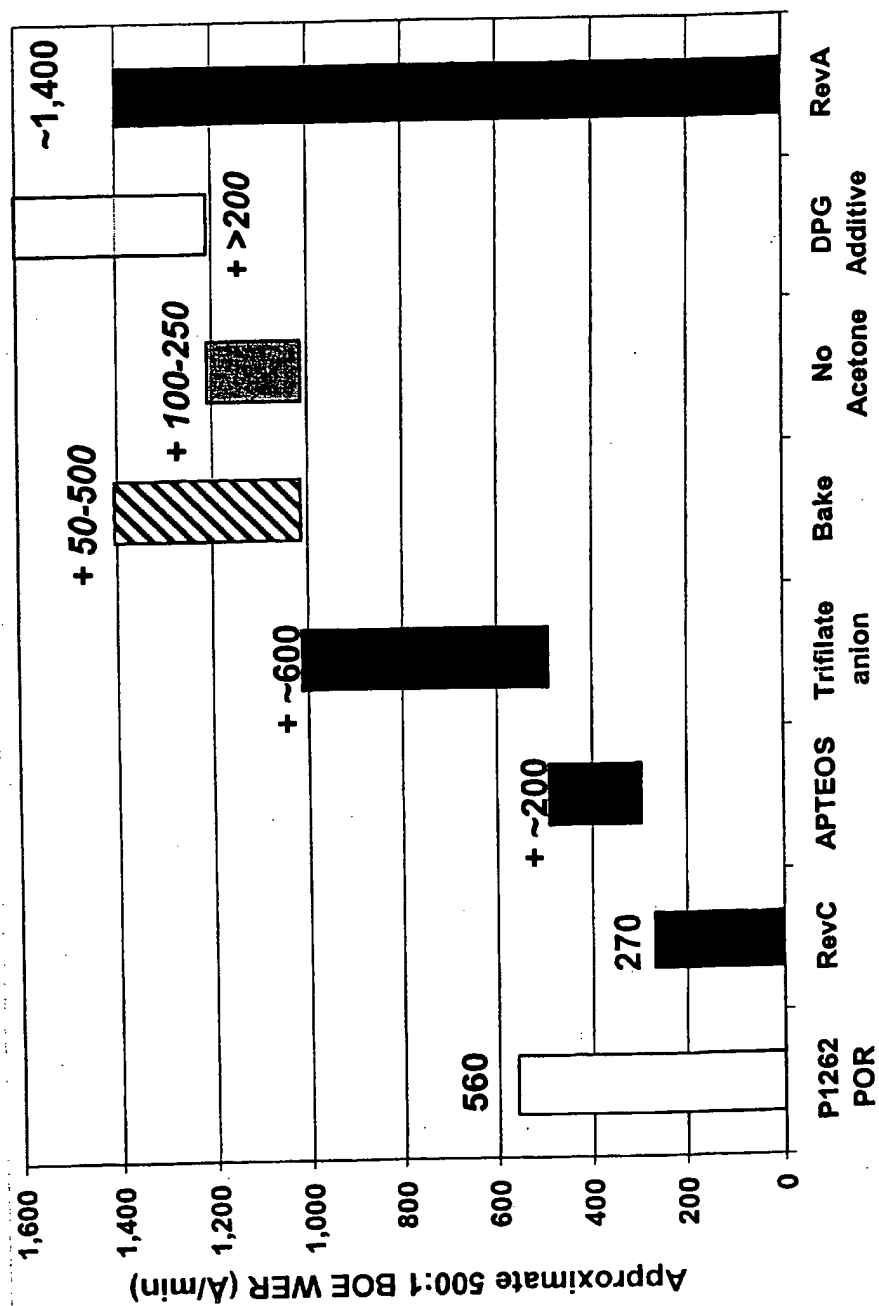


Figure 6

Figure 7

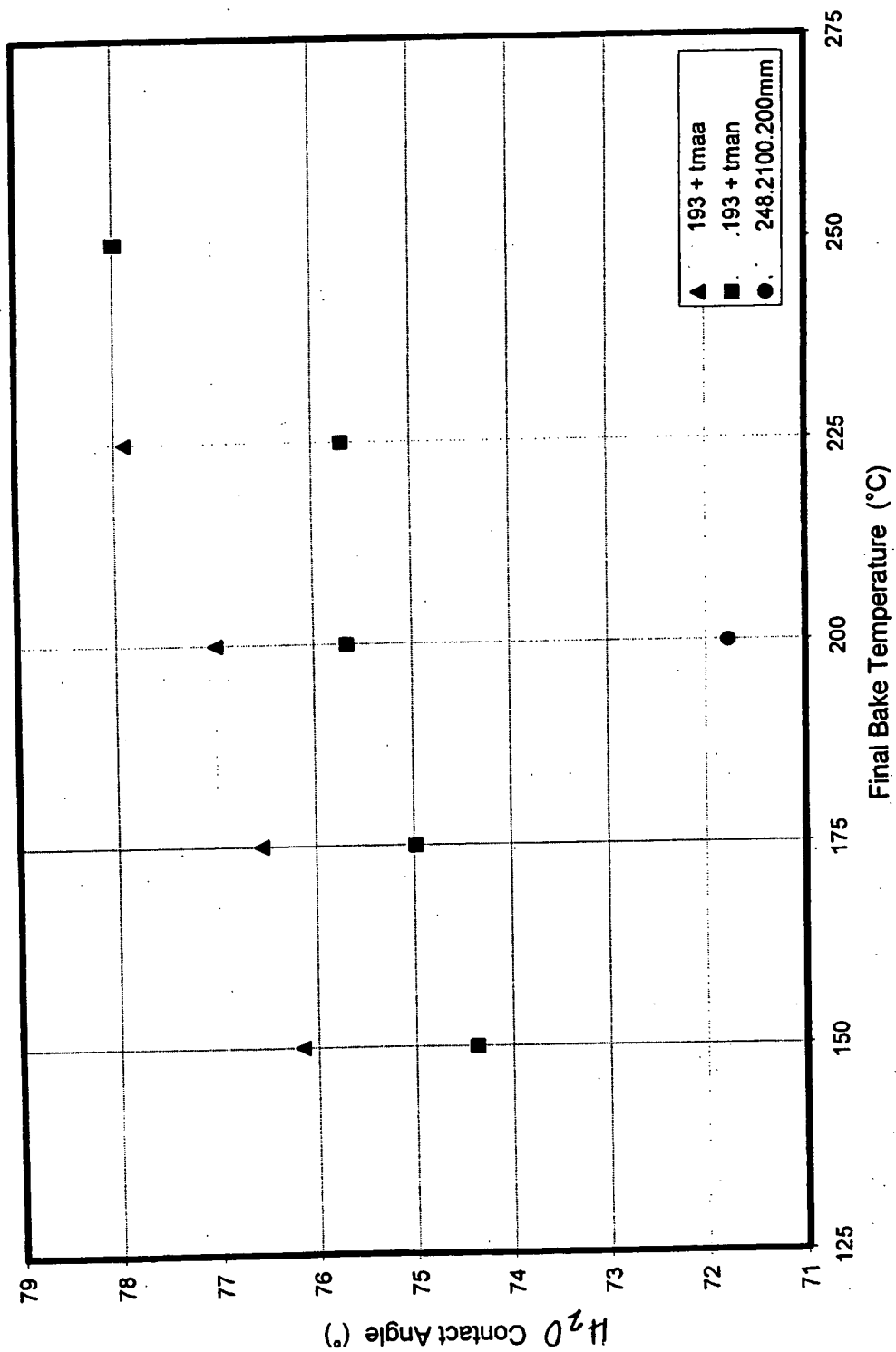
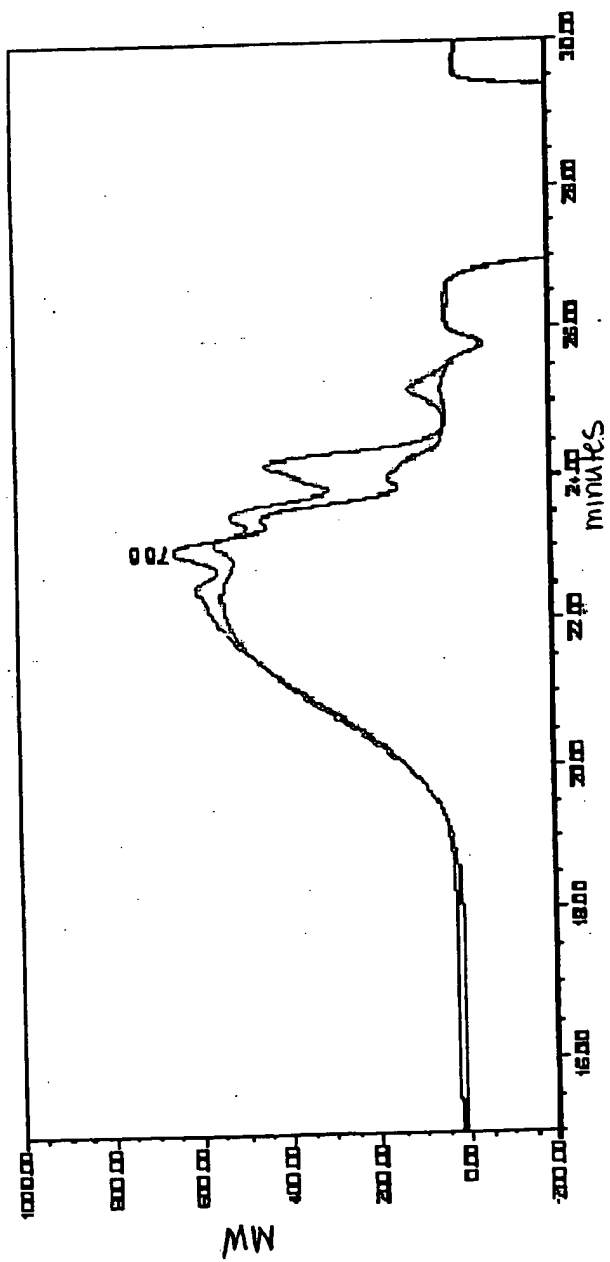


Figure 8



Product (Absorb. Comp.)	Mn	Mw	Mp	Mz	Mz+1	Polydispersity
193 + 600ppm Acidified TMAA	865	1183	737	1590	2012	1.367
w/ TMAA (after 5 days @ 40 C)	1021	1316	766	1671	2032	1.289
193 + 600ppm TMAN	789	1151	727	1582	1999	1.458
w/ TMAN (after 5 days @ 40 C)	848	1244	731	1706	2139	1.467

Figure 10

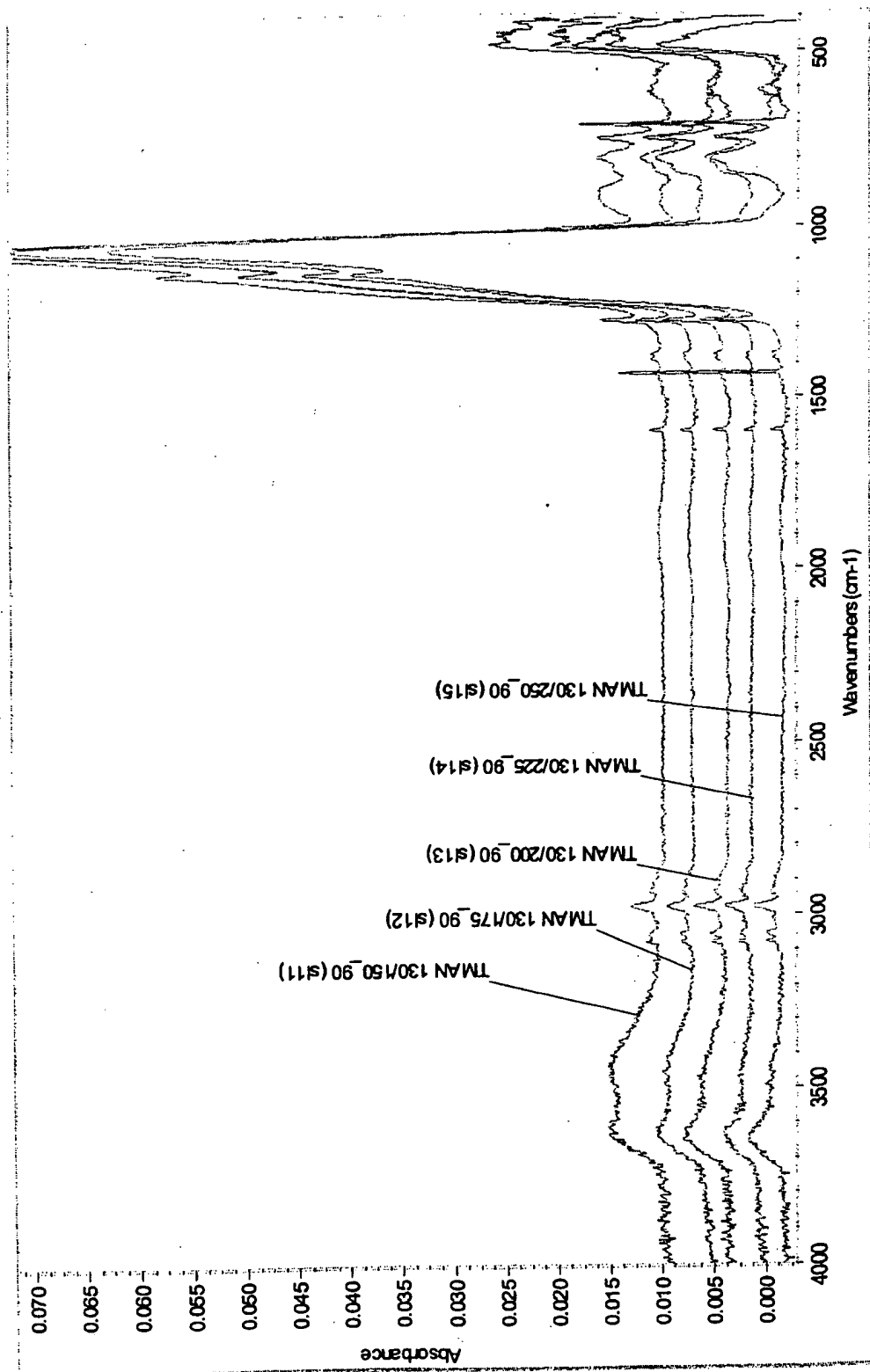


Figure 11

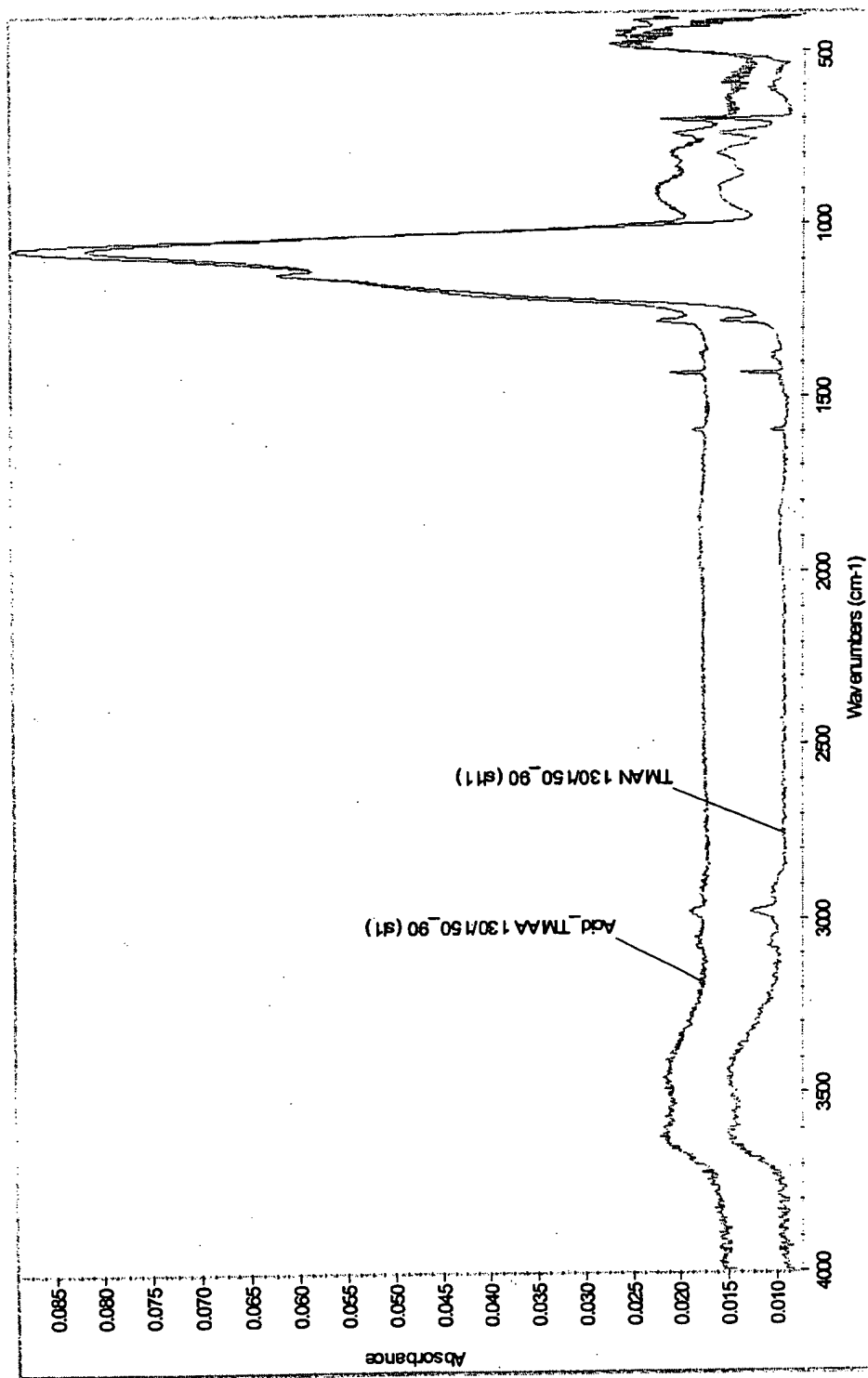


Figure 12

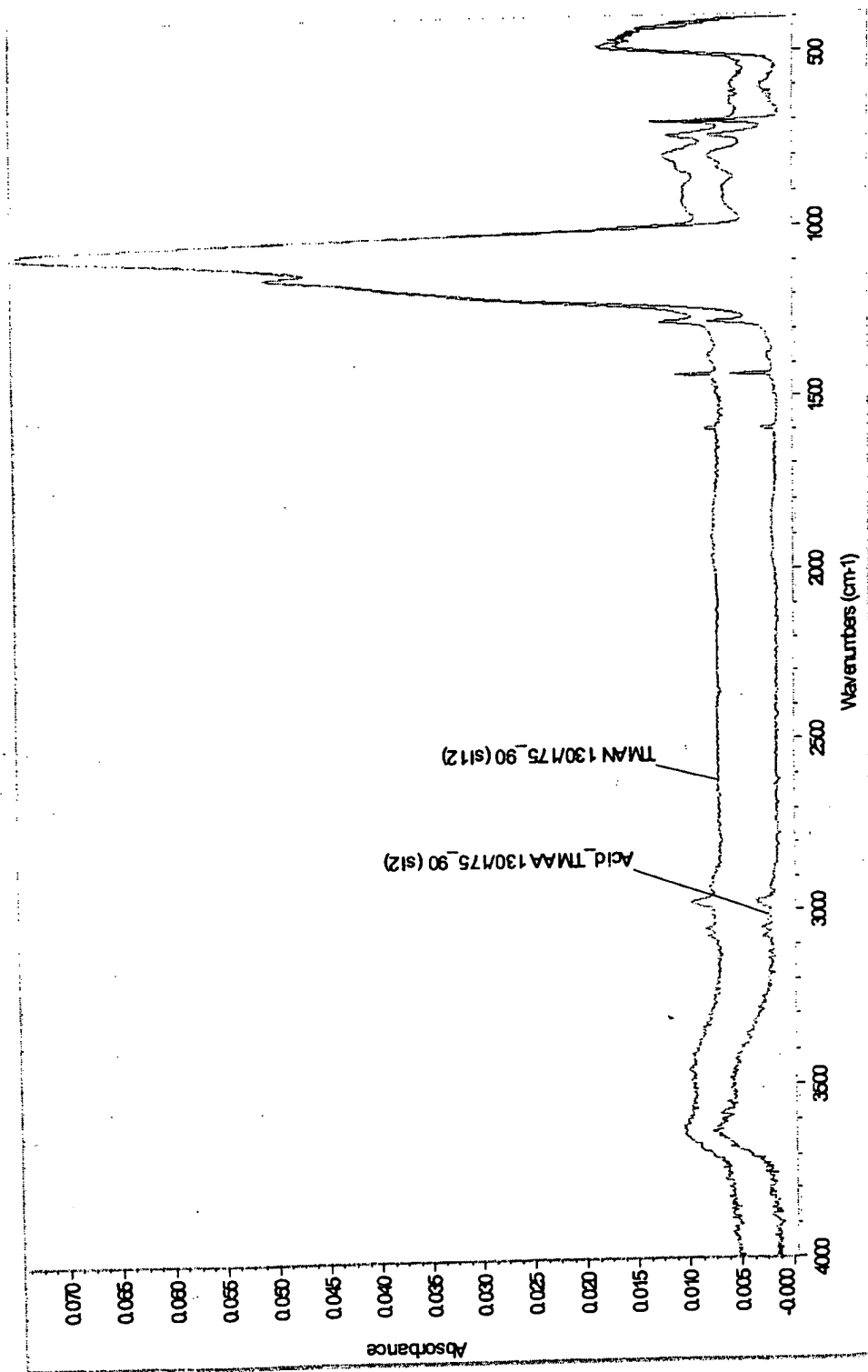


Figure 13

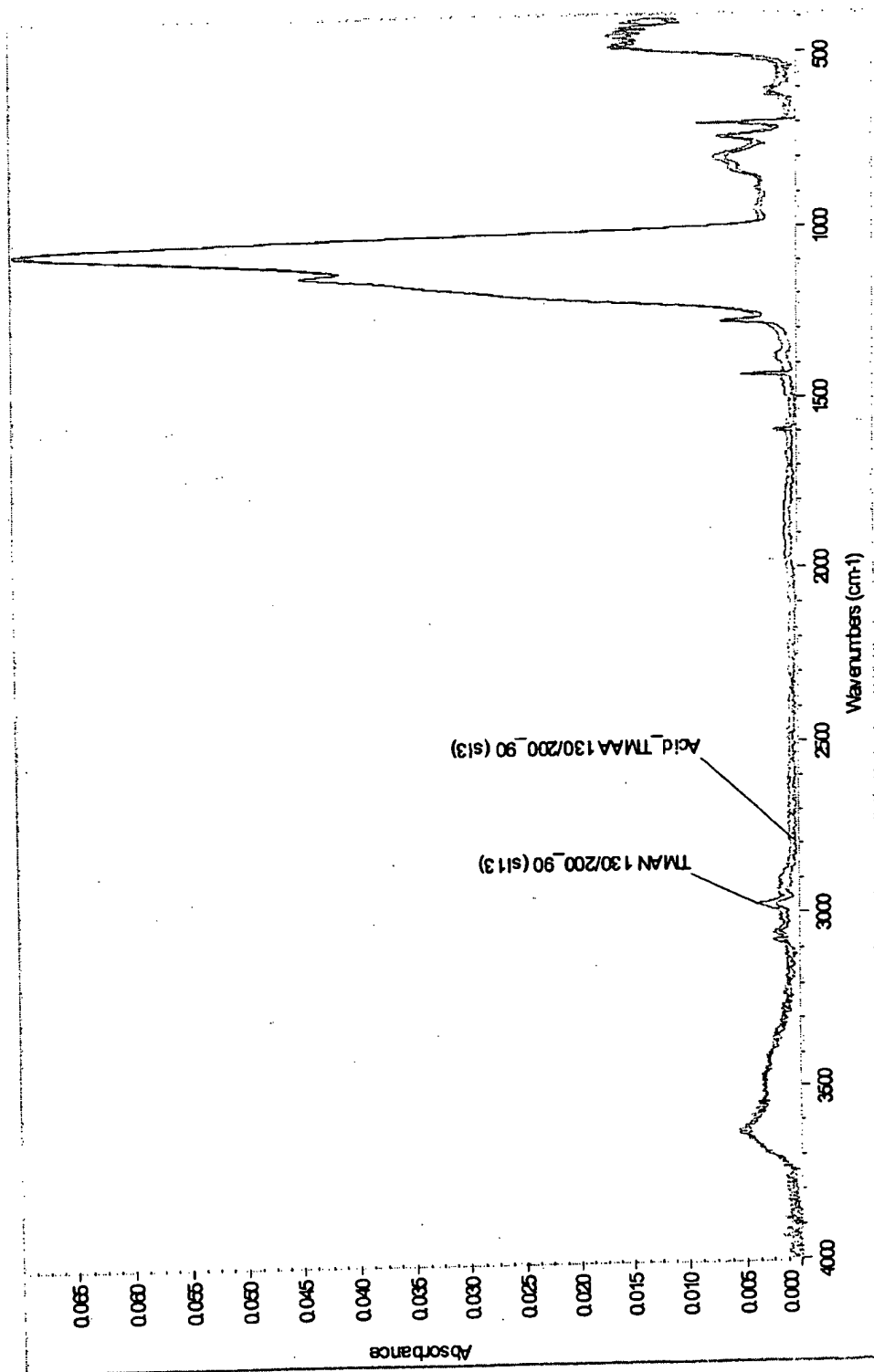


Figure 14

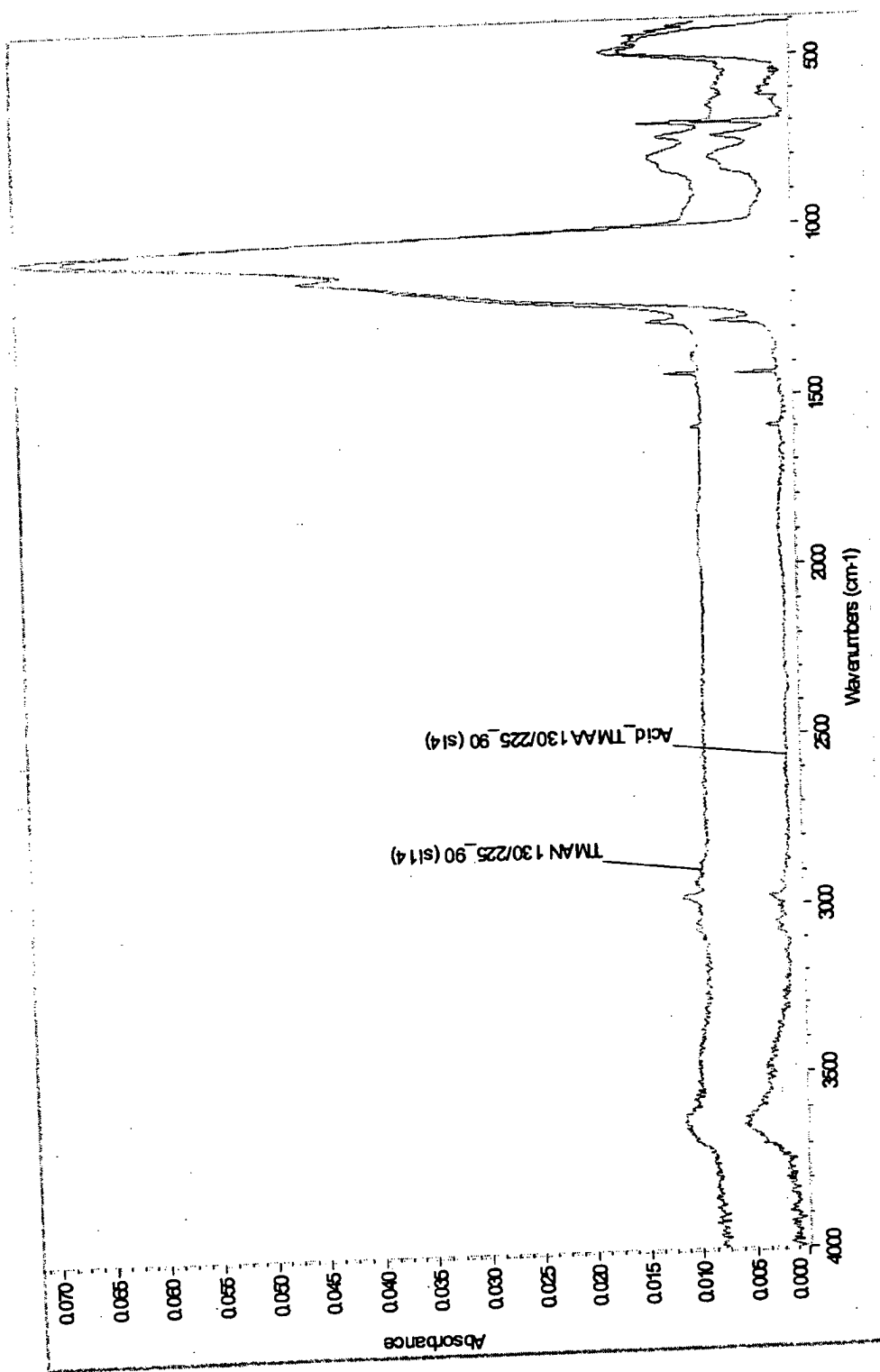


Figure 15

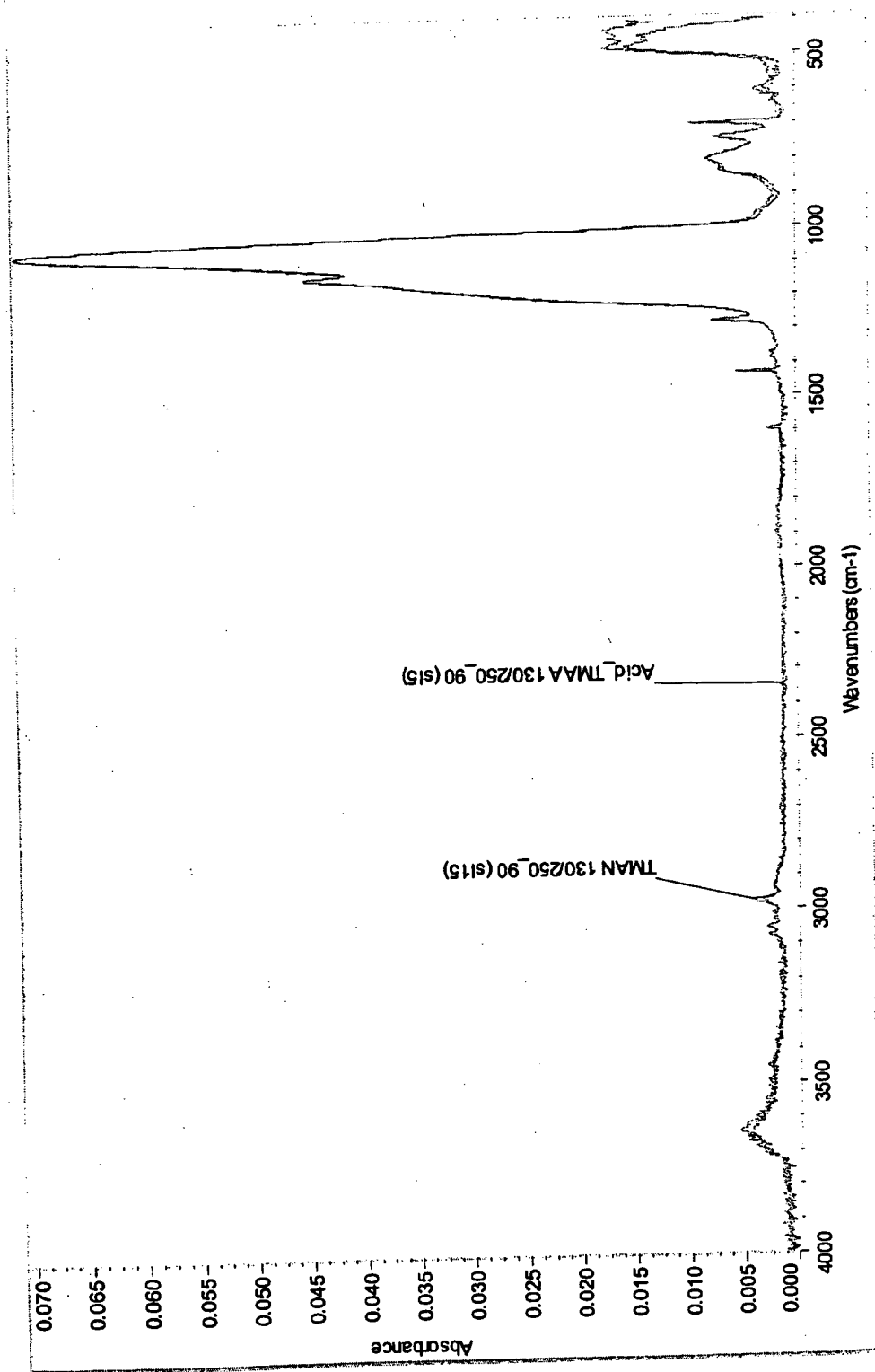


Figure 16

193 Absorb. Composition

Stabilized TMAA -vs- TMAN: Mw -vs- Aging

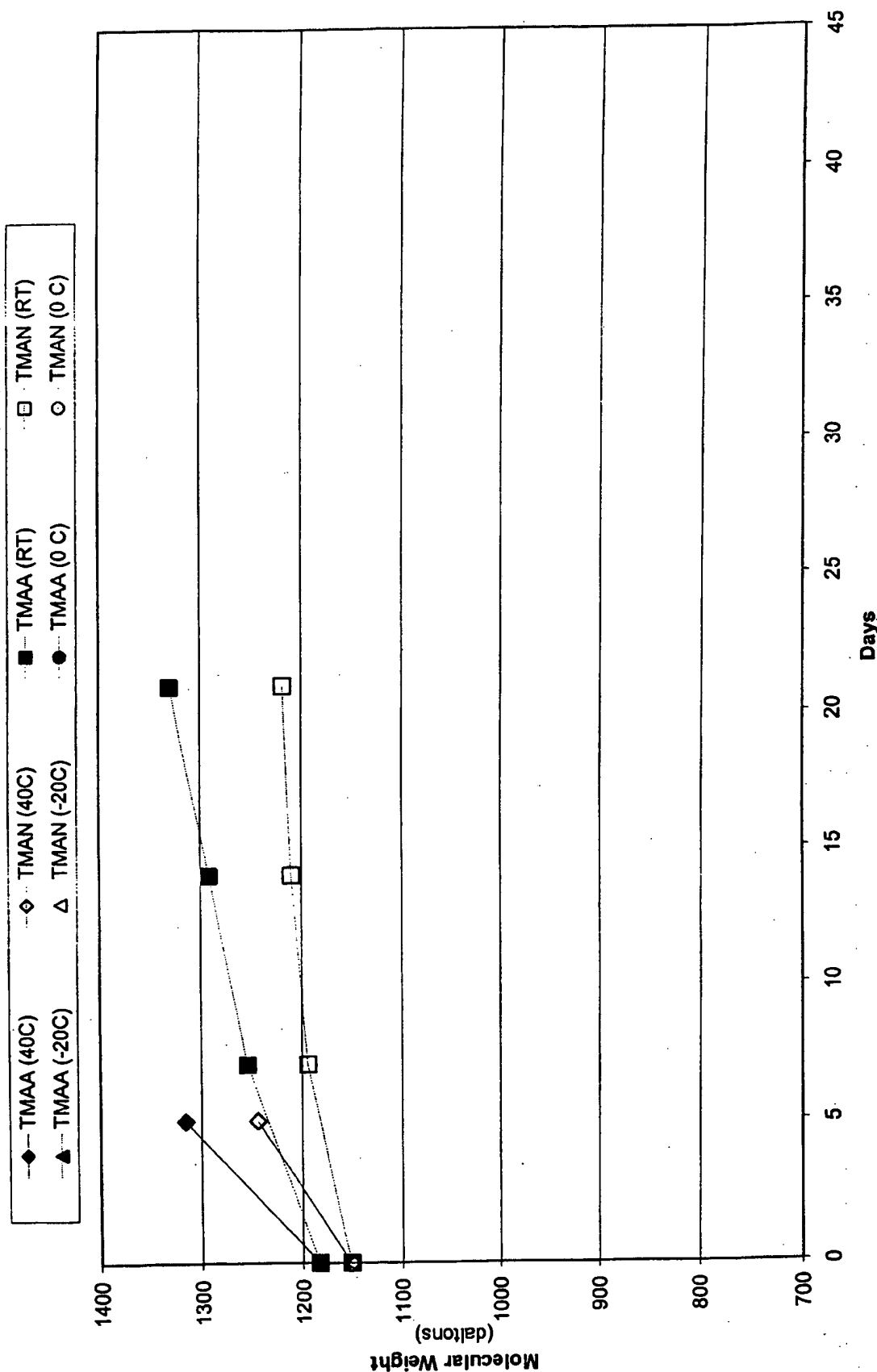


Figure 17

193 Absorb. Comp.

Stabilized TMAA -vs- TMAN: Mn -vs- Aging

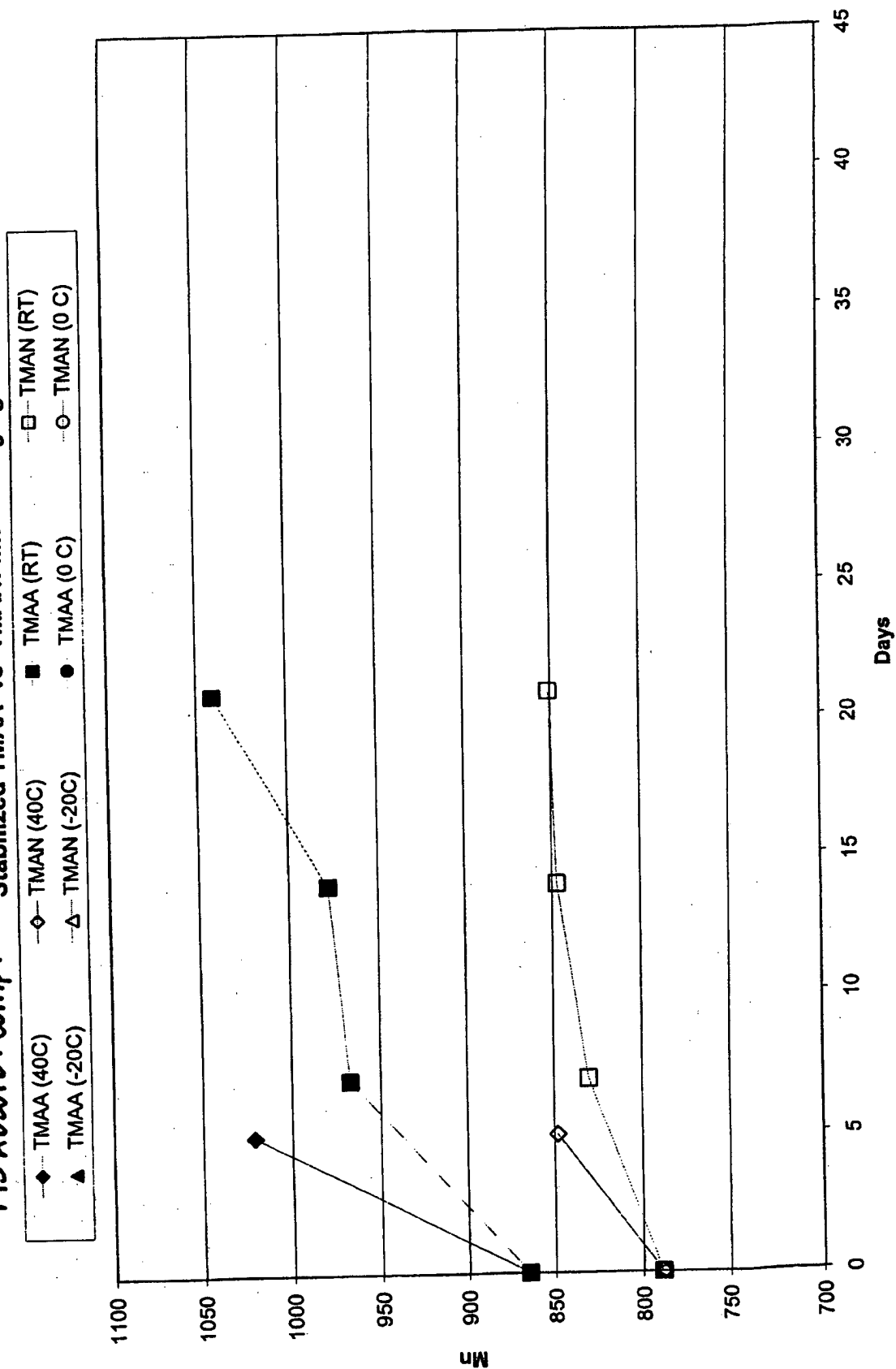


Figure 18

193 Absorb. Comp.

Stabilized TMAA -vs- TMAN: Film Thickness -vs- Aging

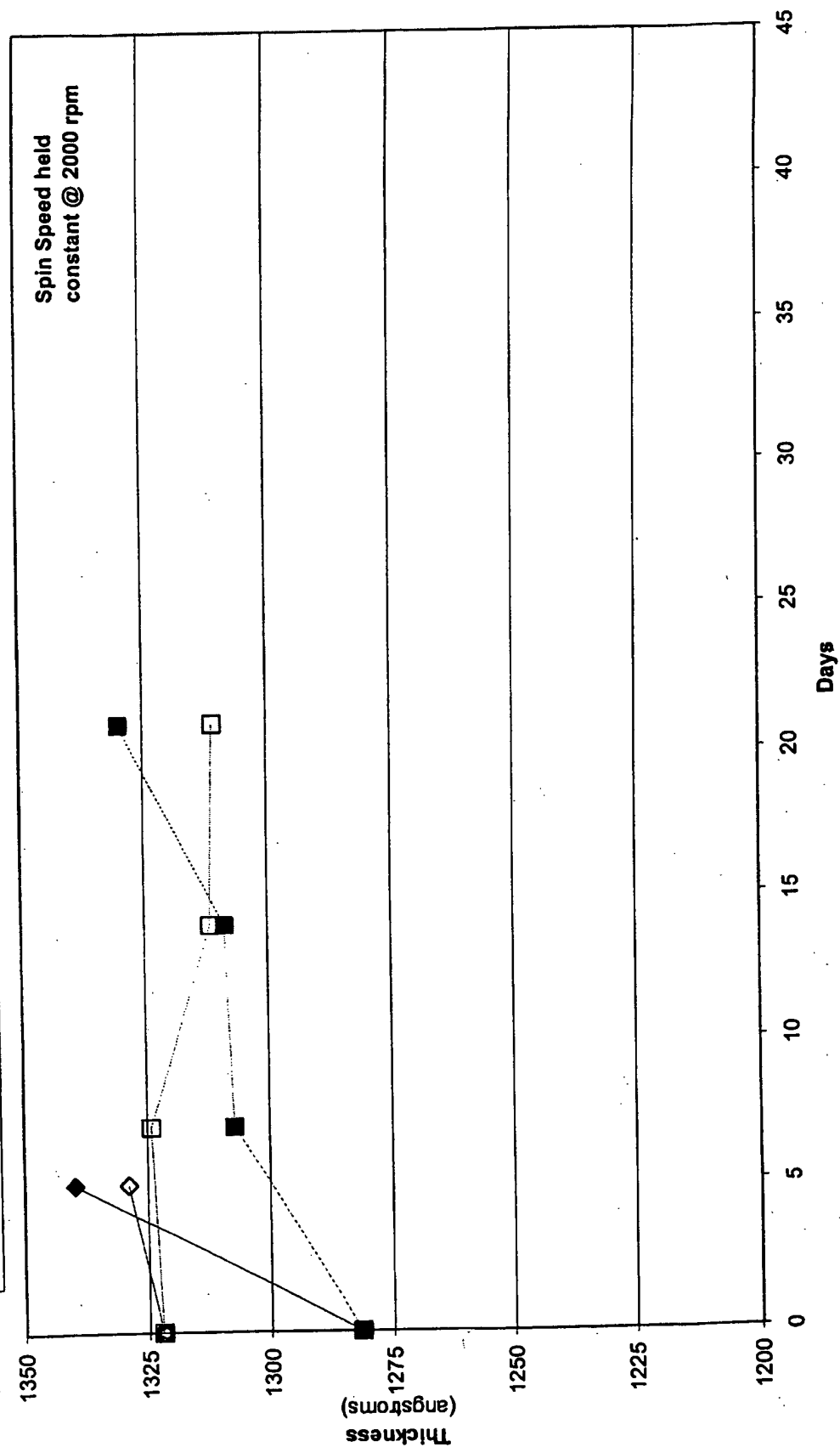
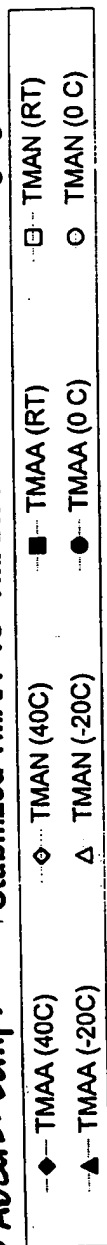


Figure 19

93 Absorb. Comp. Stabilized TMAA -vs- TMAN: Reflectance @ 193nm -vs- Aging

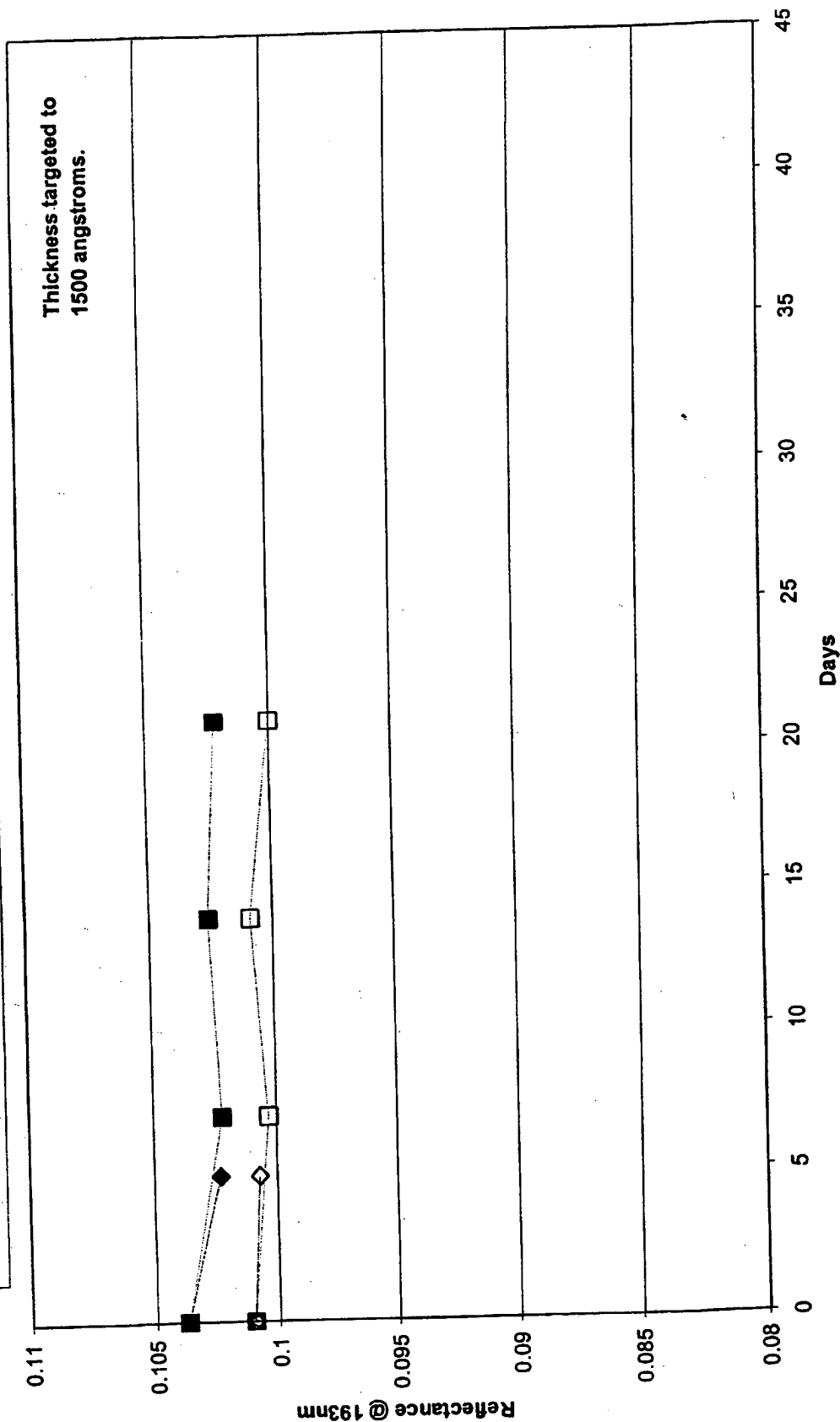
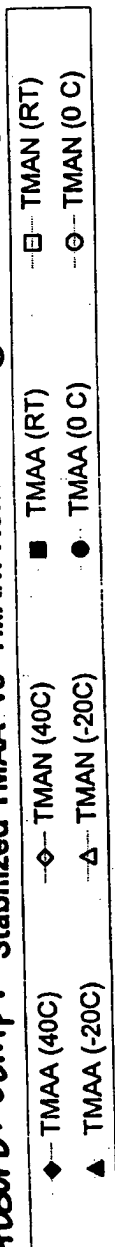


Figure 20

193 Abs. Comp. Stabilized TMAA -vs- TMAN: Refractive Index @ 193nm -vs- Aging

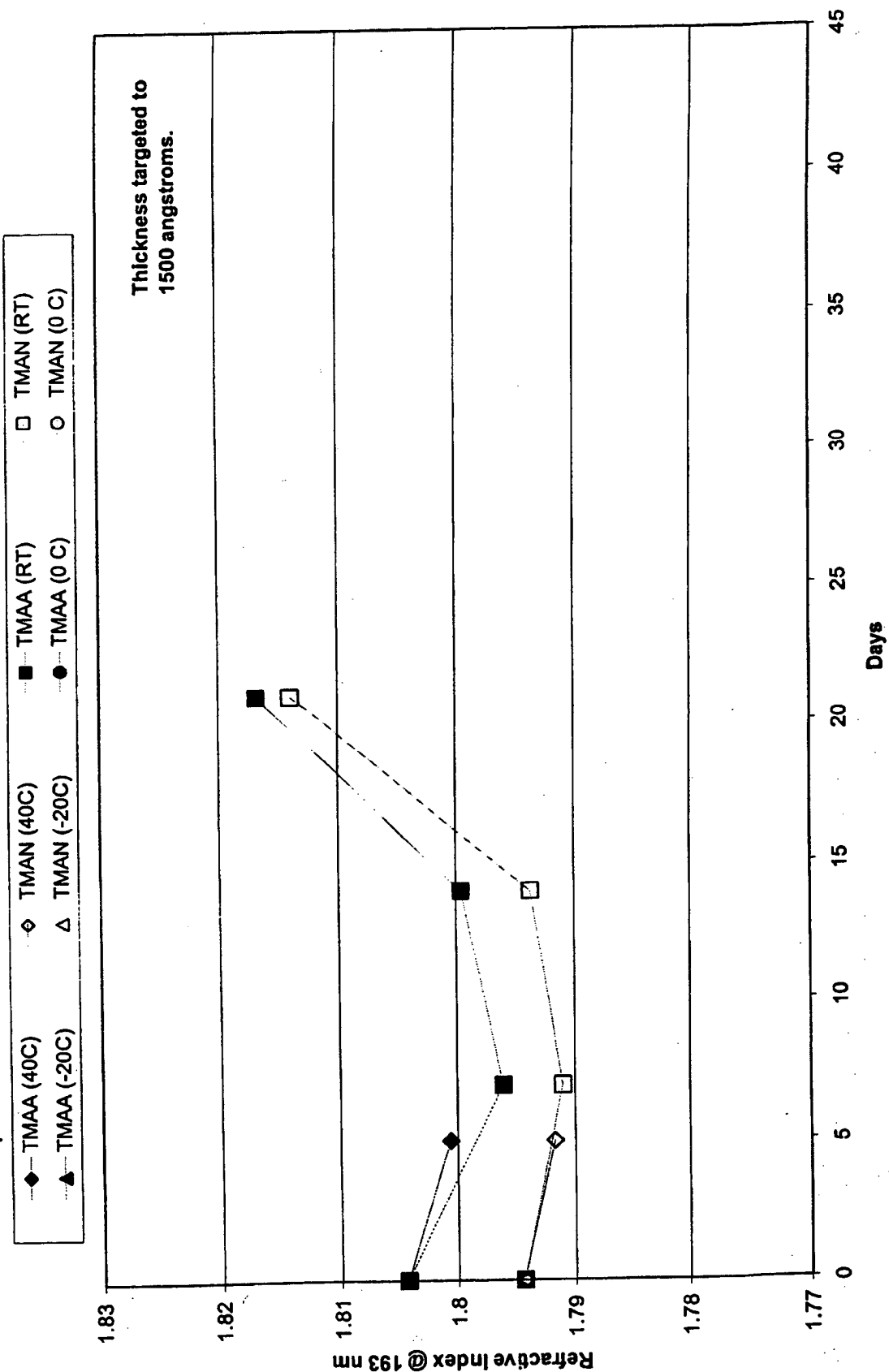


Figure 21

193 Absorb. Comp. : Stabilized TMAA -vs- TMAN: Extinction Coefficient @ 193nm -vs- Aging

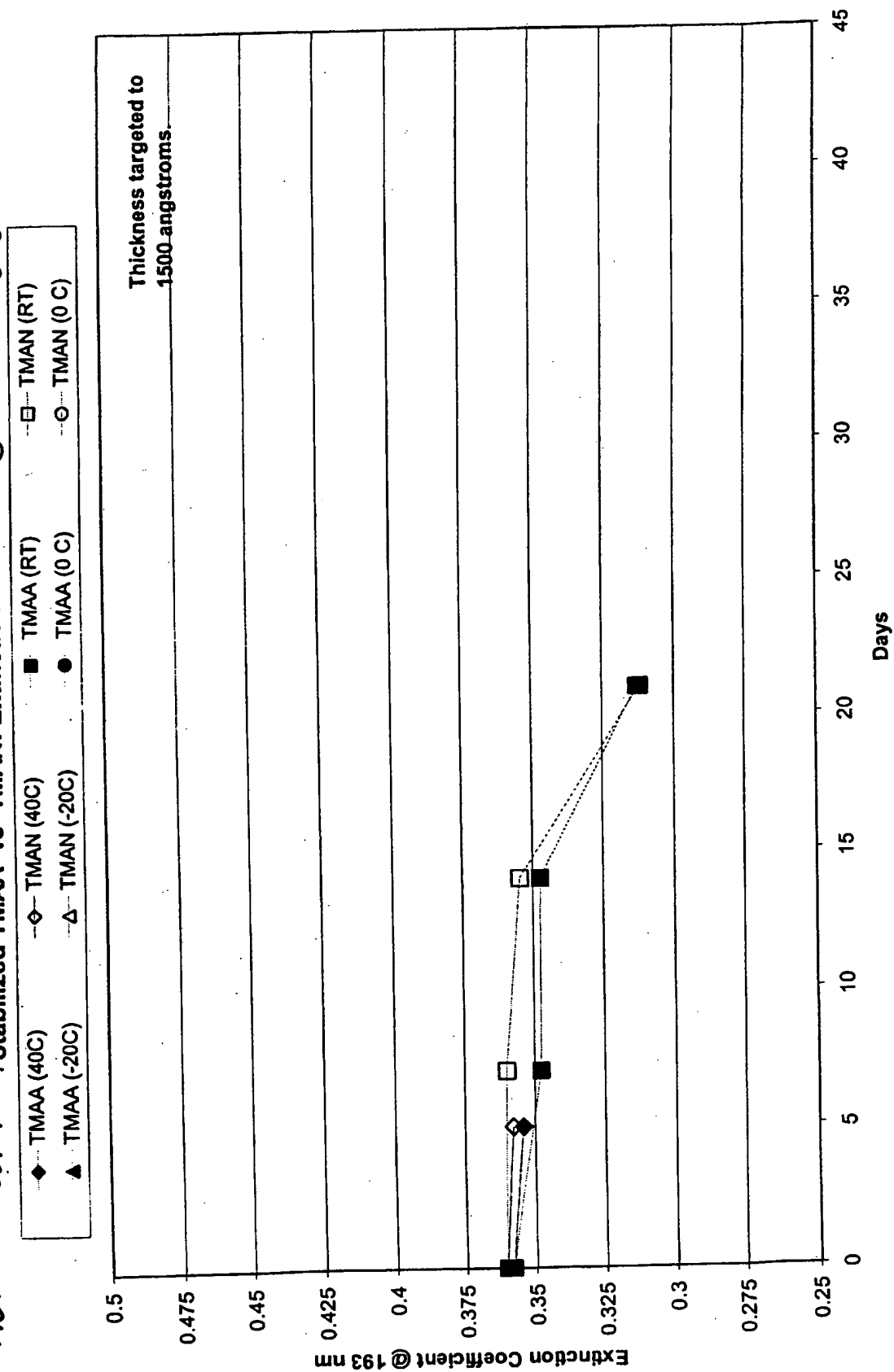


Figure 22

103 Absorb. Comp. Stabilized TMAA -vs- TMAN: Water Contact Angle -vs- Aging

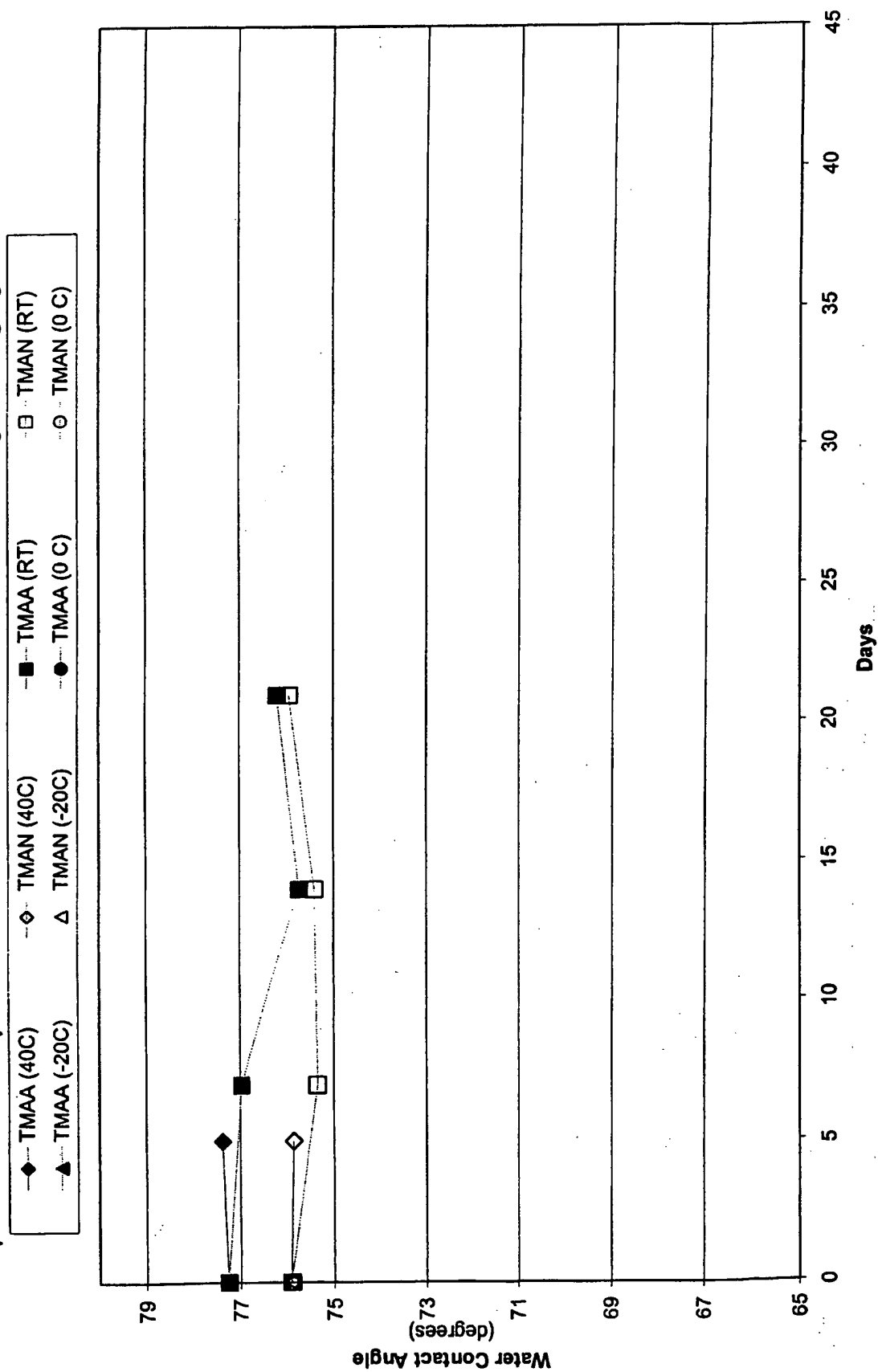


Figure 23

19b Abs. Comp. Stabilized TMAA -vs- TMAN: Ethylene Glycol Contact Angle -vs- Aging

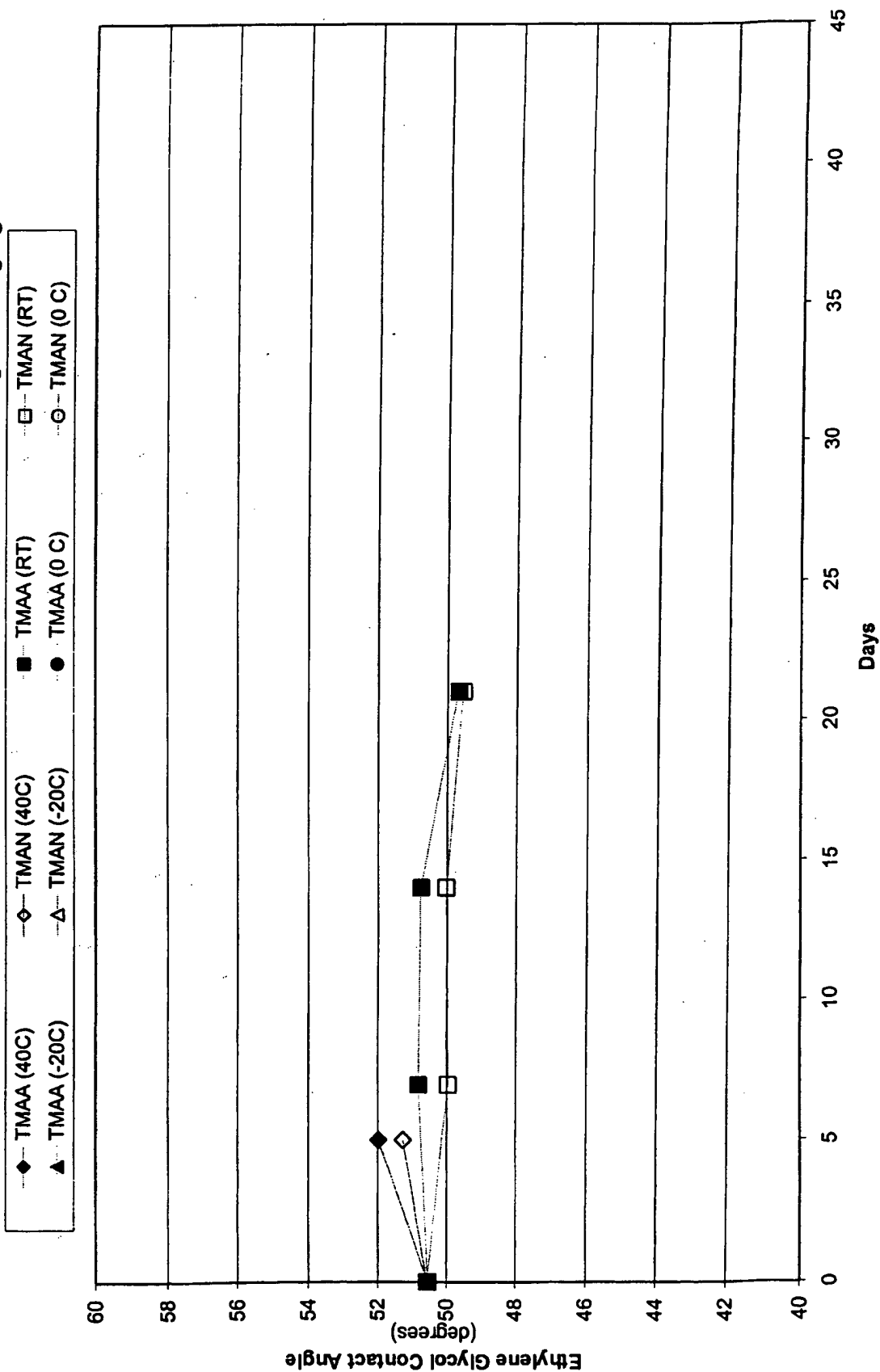


Figure 24

193 Abs. Comp.

Stabilized TMAA -vs- TMAN: TMAH Resistance -vs- Aging

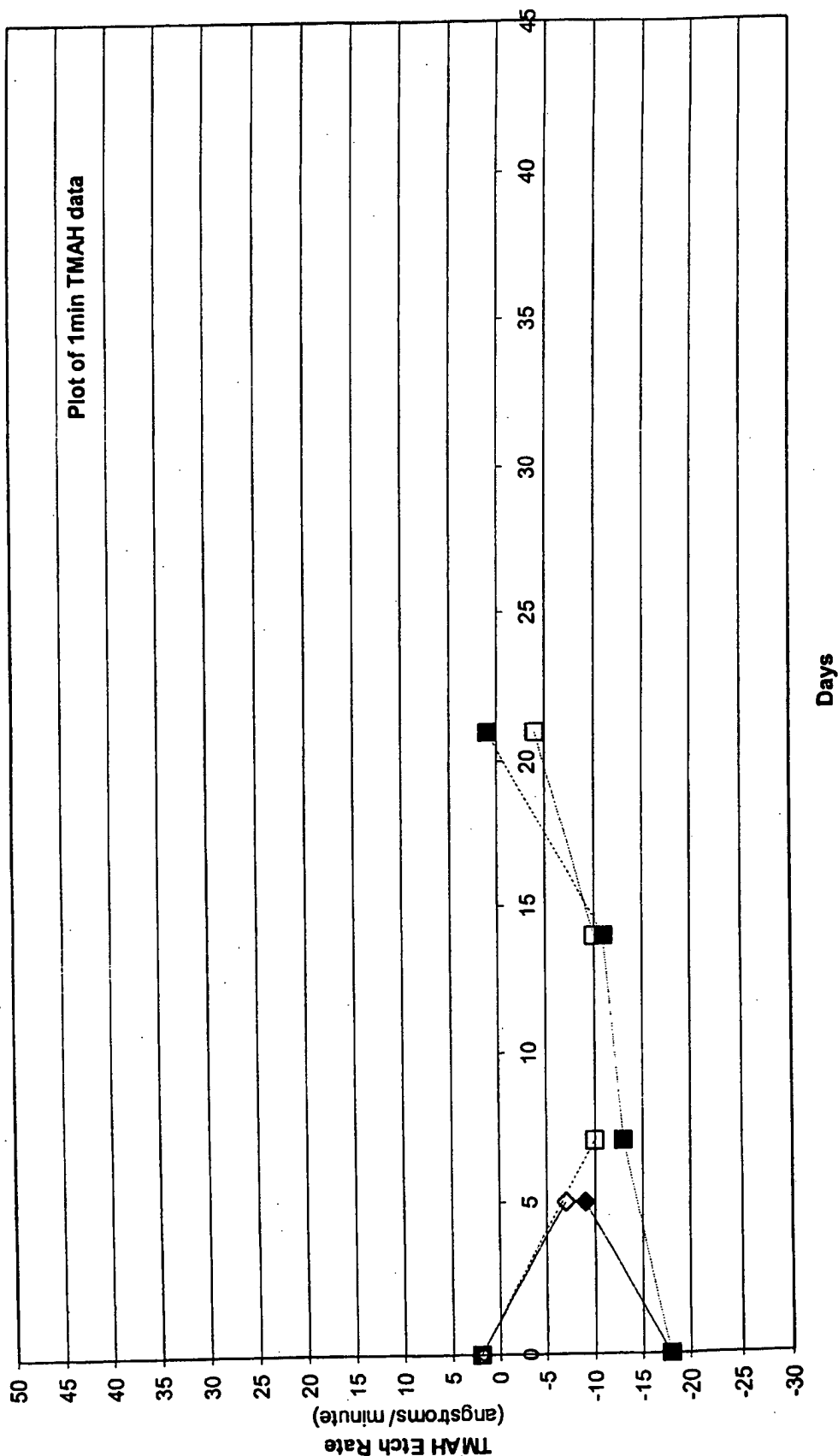
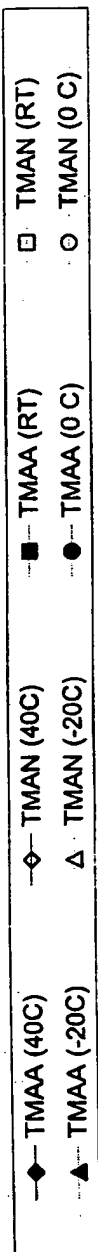


Figure 25

193 Abs. Comp. Stabilized TMAA -vs- TMAN: 500:1 BOE strip rate -vs- Aging

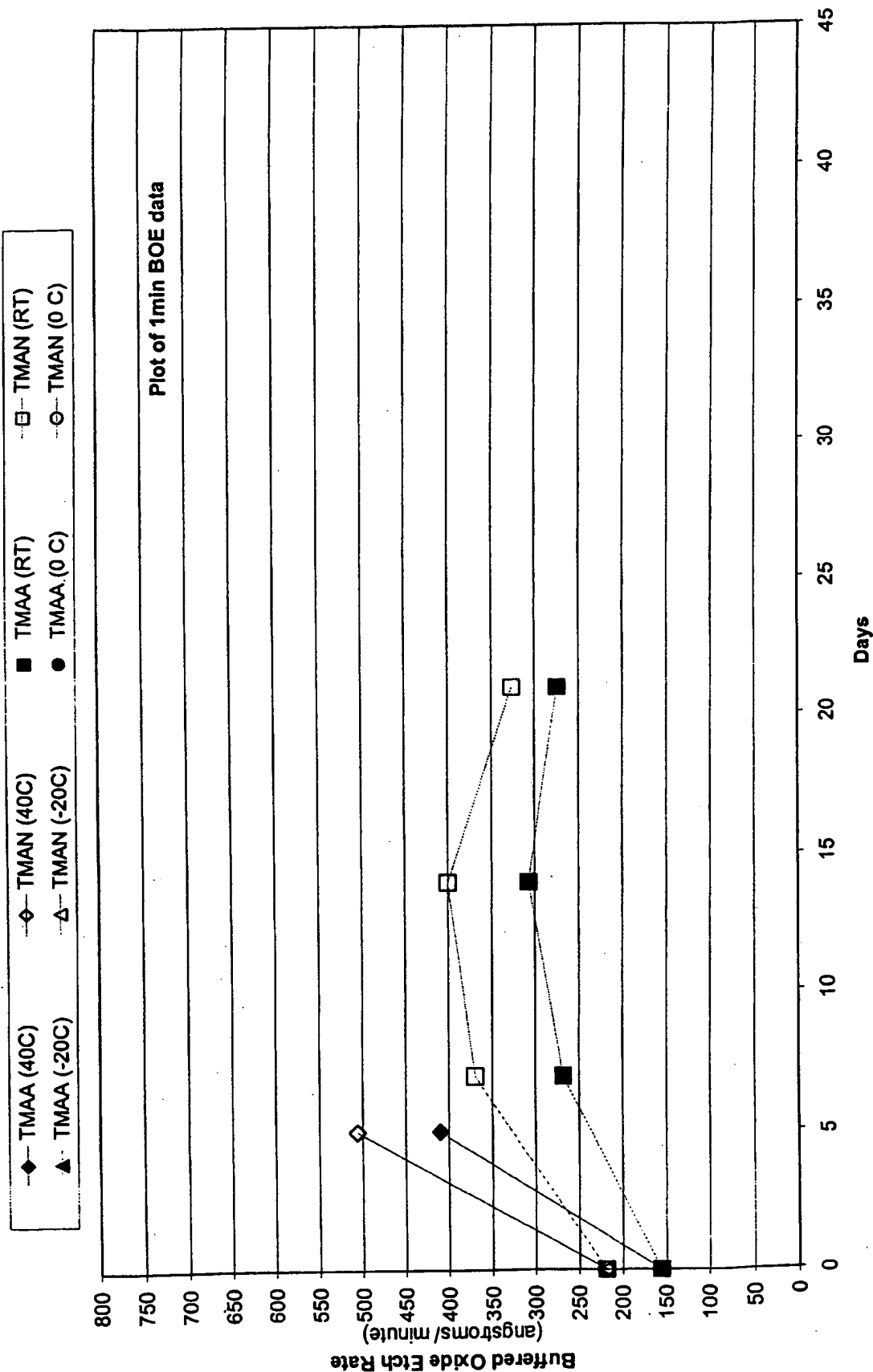


Figure 26

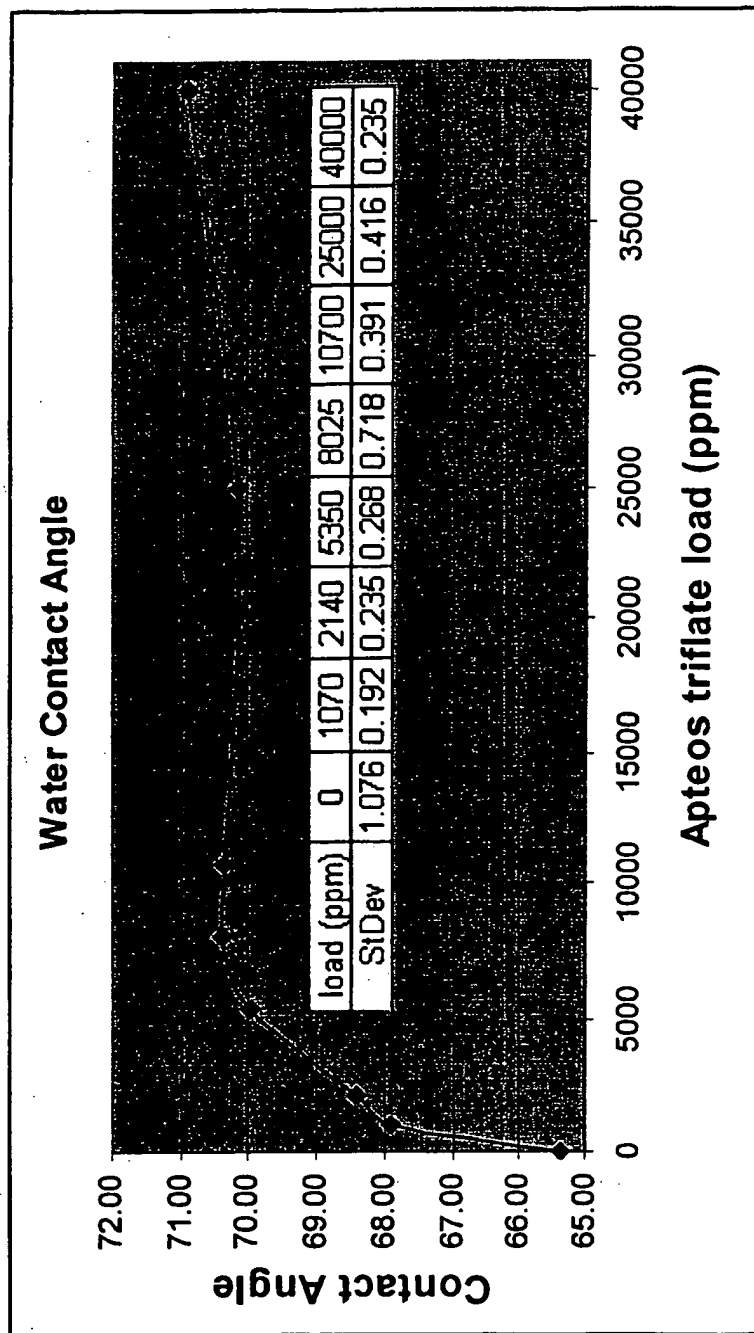


Figure 27

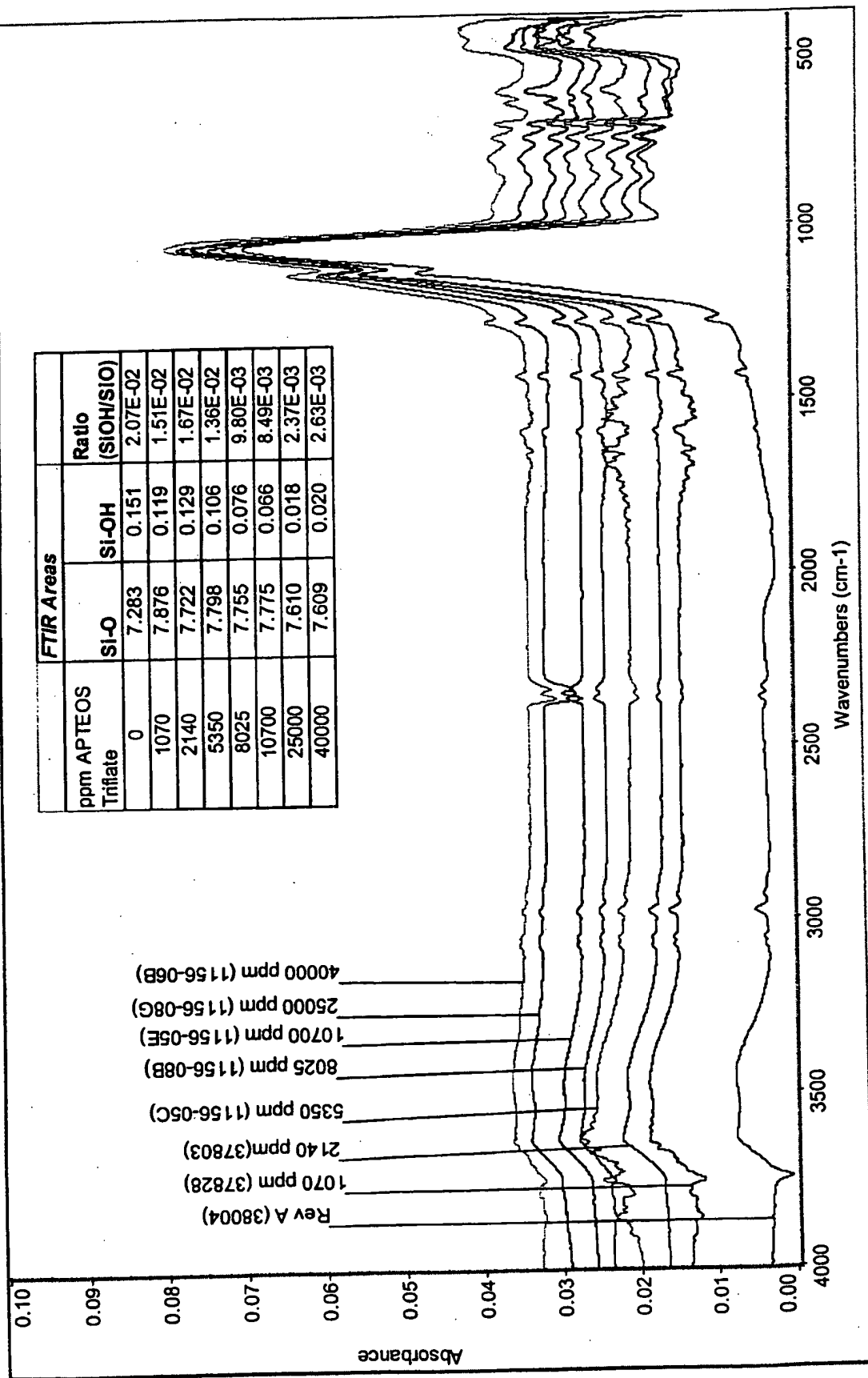


Table 3

Description	248 Absorb. Composition	193 Absorb. Comp. FOR	193 Absorb. Comp. Rev A	193 Absorb. Comp. Rev C	193 Absorb. Comp. Rev C	193 Absorb. Comp. Rev C (no acetone) + 5% DPG	193 Absorb. Comp. + 383ppm TMAH triflate	193 Absorb. Comp. + 1070ppm APTEOS triflate	193 AC. + 383ppm TMAH triflate + 3% DPG		
	130/200°C	150/250°C	130/200°C	130/200°C	130/240°C	130/200°C	130/240°C	130/240°C	130/240°C		
	50 sec each		90 sec each								
500:1BOE @ 21°C	30 sec	1224		2012	248	133	411	962	933	[1116]	
	1 min	1000		[1588]	306	201	531	820	[1030]	[1059]	
	2 min						536		854		
TMAH	1 min @	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER
	23°C	3529	2731	2694	2691	2695	2312	2670	2676	2699	3543
	50°C	3534	2715	2663	2686	2701	2331	2693	2663	2705	3516
2.3% aq. TMAH	75°C	3496	2720	2702	2720	2672	2323	2694	2677	2692	3588
	23°C	3526	2705	2679	2739	2693	2311	2702	2716	2698	3563
	50°C	3487	2714	2723	2702	2672	2327	2688	2673	2752	3519
5.0% aq. TMAH	75°C	3530	2709	2699	2709	2725	2361	2686	2673	2685	3503
	23°C	3497	2724	2687	2702	2670	2318	2691	2672	2700	3469
	50°C	3525	2722	2670	2693	2679	2327	2693	2666	2576	3483
10.0% aq. TMAH	75°C	3519	2696	2706	2709	2688	2316	2731	2653	3543	3532

Table 4

248 Absorbing Comp.		193 Absorbing Comp.		193 Absorb. Comp.		193 Absorb. Comp.		193 Absorb. Comp.	
Description		Rev C		+1070ppm APTEOS triflate		+1070ppm APTEOS triflate		+1070ppm APTEOS triflate + 1.5%DPG	
pH		<1		<1		<1		<1	
Bake Sequence		130/200 C		130/160 C		130/200 C		130/240 C	
		50 sec		90s					
500:1 BOE	1 min @ 20 °C	Pre	ER	Pre	ER	Pre	ER	Pre	ER
		3533		1676		2741		2737	
2.3% aq. TMAH	1 min @ 23 °C	Pre	ER	Pre	ER	Pre	ER	Pre	ER
		3527		1690		2720		2710	
	50 °C	3524		1676		2722		2713	
6.0% aq. TMAH	75 °C	3540		1676		2743		2692	
10.0% aq. TMAH	23 °C	3534		1681		2701		2702	
	60 °C	3543		1676		2709		2705	
	75 °C	3527		1687		2716		2671	
10.0% aq. TMAH	23 °C	3539		1690		2734		2716	
	60 °C	3532		1682		2736		2731	
	75 °C	3533		1674		2701		2731	

193 Absorb.	193 Absorb.	193 Absorb.	193 Absorb.
Comp.	Comp.	Comp.	Comp.

Description	+1070ppm APTEOS triflate + 1.5%DPG		+1070ppm APTEOS triflate + 3%DPG		+1070ppm APTEOS triflate + 3%DPG		170ppm Ammonium Triflate		170ppm Ammonium Triflate + 3% DPG		170ppm Ammonium Triflate + 3% DPG		
	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	
pH	<1		<1		<1		<1		<1		<1		
Bake Sequence	130/240 C		130/200 C		130/240 C		130/200 C		130/200 C		130/240 C		
	90s												
600:1 BOE	1 min @ 20 °C	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER
2.3% aq. TMAH	23 °C	3214	[1059]	3507	[1075]	3548	[1055]	2751	[1115]	2971	[1131]	2982	[1153]
	50 °C	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER
	75 °C	3218	[125]	3523	[130]	3564	[135]	2732	[140]	2951	[145]	2972	[150]
6.0% aq. TMAH	23 °C	3184	[130]	3510	[135]	3529	[140]	2746	[145]	2997	[150]	2960	[155]
	50 °C	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER
	75 °C	3202	[135]	3505	[140]	3519	[145]	2736	[150]	2977	[155]	2992	[160]
10.0% aq. TMAH	23 °C	3194	[140]	3533	[145]	3519	[150]	2744	[155]	2972	[160]	2952	[165]
	50 °C	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER
	75 °C	3175	[145]	3505	[150]	3479	[155]	2725	[160]	2983	[165]	2943	[170]
10.0% aq. TMAH	23 °C	3165	[150]	3495	[155]	3487	[160]	2750	[165]	2973	[170]	2953	[175]
	50 °C	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER
	75 °C	3200	[592]	3563	[625]	3496	[610]	2702	[645]	2979	[630]	2949	[665]
10.0% aq. TMAH	23 °C	3176	[610]	3504	[605]	3496	[615]	2761	[630]	2983	[625]	2949	[640]
	50 °C	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER
	75 °C	3187	[630]	3534	[655]	3500	[640]	2766	[670]	2986	[655]	2992	[670]

248 Absorb.	193 Abs.	193 Absorb.	193 Abs.	193 Absorb.
Compos.	Comp.	Comp.	Comp.	Comp.

Description	+1070ppm APTEOS Triflate + 0.5% DPG	+1070ppm APTEOS Triflate + 1.5% DPG	1070ppm "optimized" APTEOS Triflate + 0.25% DPG	1070ppm "optimized" APTEOS Triflate + 0.5% DPG	+1070ppm "optimized" APTEOS Triflate + 1% DPG	+1070ppm "optimized" APTEOS Triflate + 1.5% DPG
pH	N/A	<1	<2	<2	<2	<2
Bake Sequence	130/200 C	130/200 C	130/200 C	130/200 C	130/200 C	130/200 C
	50 sec	90 sec	90 sec			
600:1 BOE	Pre 3487	ER 2869	Pre 3177	ER 2879	Pre 2902	ER 2907
TMAH	Pre 3492	ER 2847	Pre 3190	ER 2854	Pre 2934	ER 2967
2.3% aq. TMAH	3463	2886	3190	2893	2887	2965
75 °C	3494	2875	3203	2864	2885	2987
23 °C	3496	2893	3182	2853	2898	2927
50 °C	3520	2867	3189	2844	2910	2932
75 °C	3506	2868	3184	2850	2926	2926
10.0% aq. TMAH	3499	2877	3187	2871	2967	2977
60 °C	3522	2848	3216	2899	2906	2942
75 °C	3542	2851	3186	2885	2897	2991

Table 7

193 Absorb. Comp.		193 Absorb. Comp.		193 Absorb. Comp.		193 Absorb. Comp.		193 Absorb. Comp.		193 Absorb. Comp.		193 Absorb. Comp.	
Description		+ 170ppm Ammonium Triflate + 0.25% DPG		+ 170ppm Ammonium Triflate + 0.5% DPG		170ppm Ammonium Triflate + 1% DPG		383ppm TMAH-MSA		383ppm TMAH-MSA + 1.5% DPG		1070ppm APTEOS-MSA + 1.5% DPG	
pH		<2		<2		<2		<2		<2		<2	
Bake Sequence		130/200 C		130/200 C		130/200 C		130/200 C		130/200 C		130/200 C	
		90 sec										90 sec	
500:1 BOE	1 min @ 20 °C	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER
		2804	2830	2831	2823	2816	2839	2768	2839	2839	2839	2839	2839
		Pre	Pre	Pre	Pre	Pre	Pre	Pre	Pre	Pre	Pre	Pre	Pre
2.3% aq. TMAH	1 min @ 23 °C	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER
		2786	2821	2924	2812	2828	2834	2777	2834	2834	2834	2834	2834
		2827	2835	2881	2769	2810	2831	2765	2831	2831	2831	2831	2831
5.0% aq. TMAH	1 min @ 50 °C	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER
		2762	2854	2897	2755	2848	2812	2794	2812	2812	2812	2812	2812
		2777	2841	2883	2773	2811	2868	2821	2868	2868	2868	2868	2868
10.0% aq. TMAH	1 min @ 75 °C	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER
		2785	2840	2885	2770	2827	2811	2806	2811	2811	2811	2811	2811
		2782	2818	2914	2843	2790	2863	2792	2863	2863	2863	2863	2863
10.0% aq. TMAH	1 min @ 75 °C	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER
		2781	2846	2878	2799	2793	2847	2777	2847	2847	2847	2847	2847
		2781	2846	2878	2799	2793	2847	2777	2847	2847	2847	2847	2847

Table 8

Description		193 Absorb. Compos.	193 Absorb. Comp.	193 Absorb. Comp.	193 Absorb. Comp.	193 Absorb. Comp.	193 Absorb. Comp.	193 Absorb. Comp.	193 Absorb. Comp.
		2140ppm "optimized" APTEOS triflate + 0.16% DPG	2140ppm "optimized" APTEOS triflate + 0.28% DPG	+ 170ppm "optimized" Ammonium triflate + 0.76% DPG	+ 170ppm "optimized" Ammonium triflate + 0.76% DPG	+ 225ppm "optimized" Ammonium triflate + 0.76% DPG	+ 225ppm "optimized" Ammonium triflate + 1% DPG	+ 225ppm "optimized" Ammonium triflate + 1% DPG	+ 340ppm "optimized" Ammonium triflate + 1% DPG
pH		<2	<2	<2	<2	<2	<2	<2	<2
Bake Sequence		90 sec							
600:1		90 sec							
BOE	1 min @	Pre	ER	Pre	ER	Pre	ER	Pre	ER
	20°C	2970	2933	2933	2933	2902	2938	2970	2970
2.3% aq. TMAH	1 min @	Pre	ER	Pre	ER	Pre	ER	Pre	ER
	23°C	2995	2962	2905	2913	2920	2935	2949	2949
	50°C	2965	2947	2929	2929	2908	2932	2961	2961
	75°C	2970	2946	2914	2959	2941	2962	2998	2998
5.0% aq. TMAH	23°C	2959	2932	2905	2924	2936	2929	2960	2960
	50°C	2968	2942	2915	2914	2923	2980	2991	2991
	75°C	2943	2983	2948	2932	2945	2940	2974	2974
10.0% aq. TMAH	23°C	2982	2937	2915	2944	2919	2962	2989	2989
	50°C	3012	2960	2934	2978	2909	2908	3008	3008
	75°C	2966	2971	2879	2923	2932	2937	2972	2972

Table 9

[illegible]

248 Absorb. Composition		193 Absorb. Composition		193 Absorb. Composition		193 Absorb. Composition	
Descriptions		+ 1070ppm APTEOS tosylate		+ 1070ppm APTEOS tosylate		+ 1070ppm APTEOS tosylate + 5% DPG	
pH		1.5		<1		<1	
Bake temp. (C)/Time (Sec)		150/250C -- 50sec		130/240C -- 90sec		130/200C -- 90sec	
Metrics		ER (A/min)		ER (A/min)		ER (A/min)	
2.5% TMAH @ 21°C	1 min	210		10		53	
	2 min	167		4		42	
	30 sec	[1224]		[880]		[2405]	
500:1BOE @ 21°C	1 min	1000		845		[1309]	
	2 min	[880]		>689		>656	
ER: Etch Rate (A/min);							
Pre: Pre-Immersion SOG Film Average Thickness in Angstrom;							
ER > 1000A/min.							
ER < 1000A/min.							
> Bare Si post-etch.							
[] Post-etch film is highly non-uniformed.							

Table 10

248 Absorb.
Composition

193 Absorb.
Compos.

193 Absorb.
Composition

Descriptions			RevA + 383ppm TMAH triflate	RevA + 383ppm TMAH tosylate
pH		N/A	<1	<1
Bake temp. (C)/Time (Sec)		130/200C -- 50sec	130/240C -- 90sec	130/240C -- 90sec
Metrics		ER (A/min)	ER (A/min)	ER (A/min)
2.5% TMAH @ 21°C	1 min	210	11	16
	2 min	167	4	8
500:1BOE @ 21°C	30 sec	1224	969	689
	1 min	1000	844	647
	2 min	[880]	[854]	665
ER:	Etch Rate (A/min);			
Pre:	Pre-Immersion SOG Film Average Thickness in Angstrom;			
	ER > 1000A/min.			
	ER < 1000A/min.			
>	Bare Si post-etch.			
[]	Post-etch film is highly non-uniformed.			

Table II

Table 12

	"N" wt / Si comp. Wt (ppm)	"N" mole / Si comp. Wt (ppm)	"N" mole / Si comp. Wt (ppm) (consider 95% TMAA and 96% TMAN)
AS_TMAA	589	4.422	4.201
TMAN	601.2	4.416	4.239

Table 13

193 Absorbing Composition + TMAA

Bake temp. (C)/Time (Sec)	130/150C -- 90sec	130/175C -- 90sec	130/200C -- 90sec	130/225C -- 90sec	130/250C -- 90sec
Metrics	ER (A/min)	ER (A/min)	ER (A/min)	ER (A/min)	ER (A/min)
2.5% TMAH @ 21°C	1 min	-1	5	-7	-2
PGMEA @ 21°C	6 min	0.4	-0.6	-0.4	-0.2
500:1BOE @ 21°C	30 sec	358	251	206	165
	1 min	351	243	216	151

248
Absorb.
Comp.

193 Absorbing Comp. + TMAA

Bake temp. (C)/Time (Sec)	130/150C -- 90sec	130/175C -- 90sec	130/200C -- 90sec	130/225C -- 90sec	130/250C -- 90sec	130/200C -- 60sec
Metrics	ER (A/min)	ER (A/min)	ER (A/min)	ER (A/min)	ER (A/min)	ER (A/min)
2.5% TMAH @ 21°C	1 min	1	3	-1	1	3
PGMEA @ 21°C	6 min	-0.7	-0.2	-0.7	0.1	-0.1
500:1BOE @ 21°C	30 sec	57	105	26	20	18
	1 min	55	103	312	24	18

Spin Coated @ 7PM on 5/22/03; Wet Process

Table 14

193 Absorbing Composition 248 Abs. Comp.

Descriptions		+ 600ppm TMAN	+ 600ppm Stabilized TMAA	N/A
PH		1.7	0.5	
Bake temp. (C)/Time (Sec)		130/240C -- 90sec	130/240C -- 90sec	130/200C -- 90sec
DI Water Contact Angle		78.7	78.9	74.9
Metrics		ER (A/m In)	ER (A/m In)	ER (A/m In)
2.5% TMAH @ 21°C	1 m In	-7	-9	45
	2 m In	-8	-10	47
	30 sec	263	277	785
500:1BOE @ 21°C	1 m In	506	410	937
	2 m In	413	366	720
DI Water Contact Angle		77.5	78	74.2
Metrics		ER (A/m In)	ER (A/m In)	ER (A/m In)
2.5% TMAH @ 21°C	1 m In	-10	-13	12
	2 m In	-8	-11	30
	30 sec	230	174	715
500:1BOE @ 21°C	1 m In	370	283	798
	2 m In	370	230	670
DI Water Contact Angle		79.2	77.2	72
Metrics		ER (A/m In)	ER (A/m In)	ER (A/m In)
2.5% TMAH @ 21°C	1 m In	-10	-11	24
	2 m In	-9	-7	40
	30 sec	223	215	931
500:1BOE @ 21°C	1 m In	400	307	964
	2 m In	405	313	[720]
DI Water Contact Angle		77.5	78.3	70
Metrics		ER (A/m In)	ER (A/m In)	ER (A/m In)
2.5% TMAH @ 21°C	1 m In	-4	1	96
	2 m In	-6	0	96
	30 sec	266	256	939
500:1BOE @ 21°C	1 m In	326	274	912
	2 m In	[351]	[319]	[722]

Table 15

248 Abs. Comp 193 Absorbing Composition

Descriptions			+ 600ppm Stabilized TMAA	+ 600ppm TMAA
Bake temp. (C)		130/200C	130/240C	130/240C
DI Water Contact Angle				
Metrics		ER (A/m In)	ER (A/m In)	ER (A/m In)
2.5% TMAH @ 21°C	1 m In	67	-3	-5
	2 m In	62	-2	-6
	30 sec	815	158	219
500:1BOE @ 21°C	1 m In	608	171	252
	2 m In	621	173	312
	30 sec	1835		
NE-14 @ 21°C	1 m In	2815		
DI Water Contact Angle				
Metrics		ER (A/m In)	ER (A/m In)	ER (A/m In)
2.5% TMAH @ 21°C	1 m In	31	-2	-6
	2 m In	48	-2	-4
	30 sec	753	154	195
500:1BOE @ 21°C	1 m In	735	181	303
	2 m In	[805.]	188	320
	30 sec	2835		
NE-14 @ 21°C	1 m In	2730		
DI Water Contact Angle				
Metrics		ER (A/m In)	ER (A/m In)	ER (A/m In)
2.5% TMAH @ 21°C	1 m In	74	-8	2
	2 m In	80	-2	1
	30 sec	839	165	234
500:1BOE @ 21°C	1 m In	742	188	282
	2 m In	655	188	315
	30 sec	1040		
NE-14 @ 21°C	1 m In	2730		

Table 16

248

Absorb. Comp. 193 Absorb. Composition

Descriptions			+ 600ppm Stabilized TMAA	+ 600ppm TMAA
Bake temp. (C)		130/200C	130/240C	130/240C
DI Water Contact Angle				
Metrics		ER (A/min)	ER (A/min)	ER (A/min)
2.5% TMAH @ 21°C	1 min	53	-2	-1
	2 min	56	1	-6
	30 sec	700	173	184
500:1BOE @ 21°C	1 min	688	156	253
	2 min	601	168	286
NE-14 @ 21°C	30 sec	1732		
	1 min	2825		

Table 17

248

AC

193 Absorbing Composition

+ 1070ppm "optimized" APTEOS Triflate

Description	248.2/100.200m m	Rev A								
pH	N/A	1.5	<2							
Bake Sequence	130/200 C	130/200°C	90 sec							
500:1 BOE	50 sec	90 sec	ER	ER	ER	ER	ER	ER	ER	ER
1 min @ 20 °C			ER	ER	ER	ER	ER	ER	ER	ER
TMAH 1 min @ 23 °C										
2.3% aq. TMAH	780	100	144	105	116	372	228	179	129	
	781	781	797	622	416					
5.0% aq. TMAH	1529	298	347	256	222	123				
	1535	121	261	789	782	621	406	321	211	
10.0% aq. TMAH	1535	166	196	36	40	46				
	1535	716	766	704	485	294	205	115	11	
	1535	270	1381	1594	123	900	745	462	332	

Table 18

248 AG



193 Absorbing Composition

Description		248.2100.200mm	Rev A + 1070ppm "optimized" APTEOS TriFlate + 1.5% DPG					
pH		N/A	<2	<2	<2	<2	<2	<2
Bake		130/200 C	130/180 C	130/200C	130/220C	130/240C	130/260C	
Sequence		50 sec	90 sec					
500:1	1 min @	ER	ER	ER	ER	ER	ER	ER
BOE	20 °C	12400	12400	12400	12400	12400	12400	12400
TMAH	1 min @							
2.5% aq.	23 °C	393	386	446	123			
TMAH	50 °C	193	500	123	400	590	538	
	75 °C							
5.0% aq.	23 °C	818	110	50	2	70	40	
TMAH	50 °C	4000	959	400	275	90	40	
	75 °C	1000	280	230	1000	900	856	
10.0% aq.	23 °C	8180	503	105	70	30	20	
TMAH	50 °C	4000	959	400	275	90	40	
	75 °C	1000	280	230	1000	900	856	

Table 19

248
AC

193 Absorbing Composition

Description		248.2100.200m m	Rev A	+ 1070ppm "optimized" APTEOS MSA + 1.5% DPG							
pH		N/A	1.5	<2	<2	<2	<2	<2	<2	<2	<2
Bake Sequence		130/200 C	130/200°C	130/180 C	130/200°C	130/220C	130/240°C	130/250C	130/280C		
		50 sec	90 sec	90 sec	90 sec	90 sec	90 sec	90 sec	90 sec		
500:1 BOE		ER	ER	ER	ER	ER	ER	ER	ER	ER	ER
1 min @											
20°C		748	1684	1189	986	892	800	800	800	800	800
1 min @											
23°C		748	1684	1189	986	892	800	800	800	800	800
2.3% aq. TMAH		780	1100	191	507	518	201	242	226	226	226
50°C		193	781	120	507	518	201	242	226	226	226
75°C											
5.0% aq. TMAH											
23°C											
50°C		1527	289	444	115	78	15	35	40	40	40
75°C		1500	191	230	695	686	372	466	380	380	380
10.0% aq. TMAH											
23°C		1354	166	34	25	22	30	30	30	30	30
50°C		1350	716	906	387	168	98	89	83	83	83
75°C		1521	400	231	156	102	746	970	513	513	513

Table 20

Materials	pH	Days at 40C	Mn	Mw	Mp	Mz	Mz+1	PDI
Rev A + 1070 ppm "opt" apteos triflate	1.732	0	780	1109	735	1488	1844	1.422
		5	1062	1568	1329	2188	2853	1.476
Rev A + 1070 ppm "opt" apteos triflate + 1.5% DPG	<2	0	891	1269	754	1722	2179	1.424
		7	1058	1486	1198	1995	2520	1.404
Rev A + 1070 ppm apteos msa + 1.5% DPG	<2	0	880	1241	749	1680	2127	1.41
		7	1006	1410	1175	1887	2364	1.402

193 Absorb. Comp.

5 days at 40C	193AC	Mn	Mw	110 nm via fill
pH1.5 + 2000ppm				
nitric acid acidified TMAA	1289	1641	No voiding	

Table 21

248

AC

193 Absorbing Composition (AC)

Description	248.2100.200 mm	Rev A	pH 5.5	Rev A +	Rev A +	Rev A +	Rev A	Rev A
				1070ppm APTEOS Nitrate	1070ppm APTEOS Nitrate + 1.5% DPG	1070ppm APTEOS Nitrate + 3% DPG	1070ppm APTEOS Nitrate + 6% DPG	1070ppm APTEOS Nitrate + 9% DPG
pH	N/A	1.5	5.5	<2	<2	<2	<2	<2
Bake Sequence	130/200 C	130/200°C	130/240 C	130/240 C				
	50 sec N2	90 sec N2	60 sec N2	90 sec N2				
500:1 BOE	ER		ER	ER	ER	ER	ER	ER
TMAH		Pre						
2.5% aq.		2694						
TMAH		2663						
		2702						
5.0% aq.		2679						
TMAH		2723						
		2699						
10.0% aq.		2687						
TMAH		2670						
		2706						

Table 22-

Description	Thickness	1 dev	Reflectance @ 193nm	n @ 193nm	k @ 193nm
193 Rev A	1469	12.2	9.77	1.8027	0.3811
193 Rev A + 1070 ppm APTEOS Triflate	1502	15.4	10.26	1.8019	0.3469
193 Rev A + 2140 ppm APTEOS Triflate	1514	12.1	10.33	1.7945	0.3304
193 Rev A + 5350 ppm APTEOS Triflate	1509	15.4	10.18	1.7931	0.3362
193 Rev A + 8025 ppm APTEOS Triflate	1512	9.7	10.19	1.7918	0.3329
193 Rev A + 10700 ppm APTEOS Triflate	1506	12.7	10.15	1.7958	0.3427
193 Rev A + 25000 ppm APTEOS Triflate	1500	12.2	10.14	1.7998	0.3526
193 Rev A + 40000 ppm APTEOS Triflate	1533	10.5	10.16	1.7793	0.3276

193 Absorbing Comp.

Table 23

ppm APTEOS Triflate	40C Aging	Mn	Mw	Mp	Mz	Mz+1	Polydispersity
193 + 1070ppm APTEOS Triflate	0	920	1283	759	1724	2173	1.395362
	5	1279	1681	1405	2174	2706	1.314284
193 + 2140 ppm APTEOS Triflate	0	754	1119	744	1562	2000	1.483957
	5	955	1378	788	1897	2455	1.442483
193 + 5350 ppm APTEOS Triflate	0	876	1226	754	1640	2046	1.39940
	5	984	1367	779	1819	2268	1.38917
193 + 8025 ppm APTEOS Triflate	0	877	1228	754	1646	2058	1.40051
	5	988	1369	1112	1812	2247	1.38518
193 + 10700 ppm APTEOS Triflate	0	875	1226	755	1642	2052	1.40143
	5	1001	1396	1156	1860	2320	1.39492
193 + 25000 ppm APTEOS Triflate	0	846	1204	764	1635	2060	1.42421
	5						
193 + 40000 ppm APTEOS Triflate	0	835	1169	755	1558	1930	1.39928
	5	846	1260	773	1726	2168	1.489298

193 Absorb. Comp.

Table 24

248 AC 1 193 Absorbing Composition

Description	248.2100.200mm	Rev A	Rev A + 10,700 ppm APTEOS Triflate (10X)	Rev A + 40,000 ppm APTEOS Triflate (37X)
pH	N/A		<2.5	<2.5
Bake	130/200 C	130/200 C	130/240 C	
Sequence	50 sec N2	90 sec N2	90 sec N2	
500:1 BOE	ER	ER	ER	ER
TMAH 1 min @ 20°C	75	100	334	809
2.5% aq. TMAH	493	100	334	809
5.0% aq. TMAH	287	298	309	809
10.0% aq. TMAH	166	162	162	878

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